March 30, 1942

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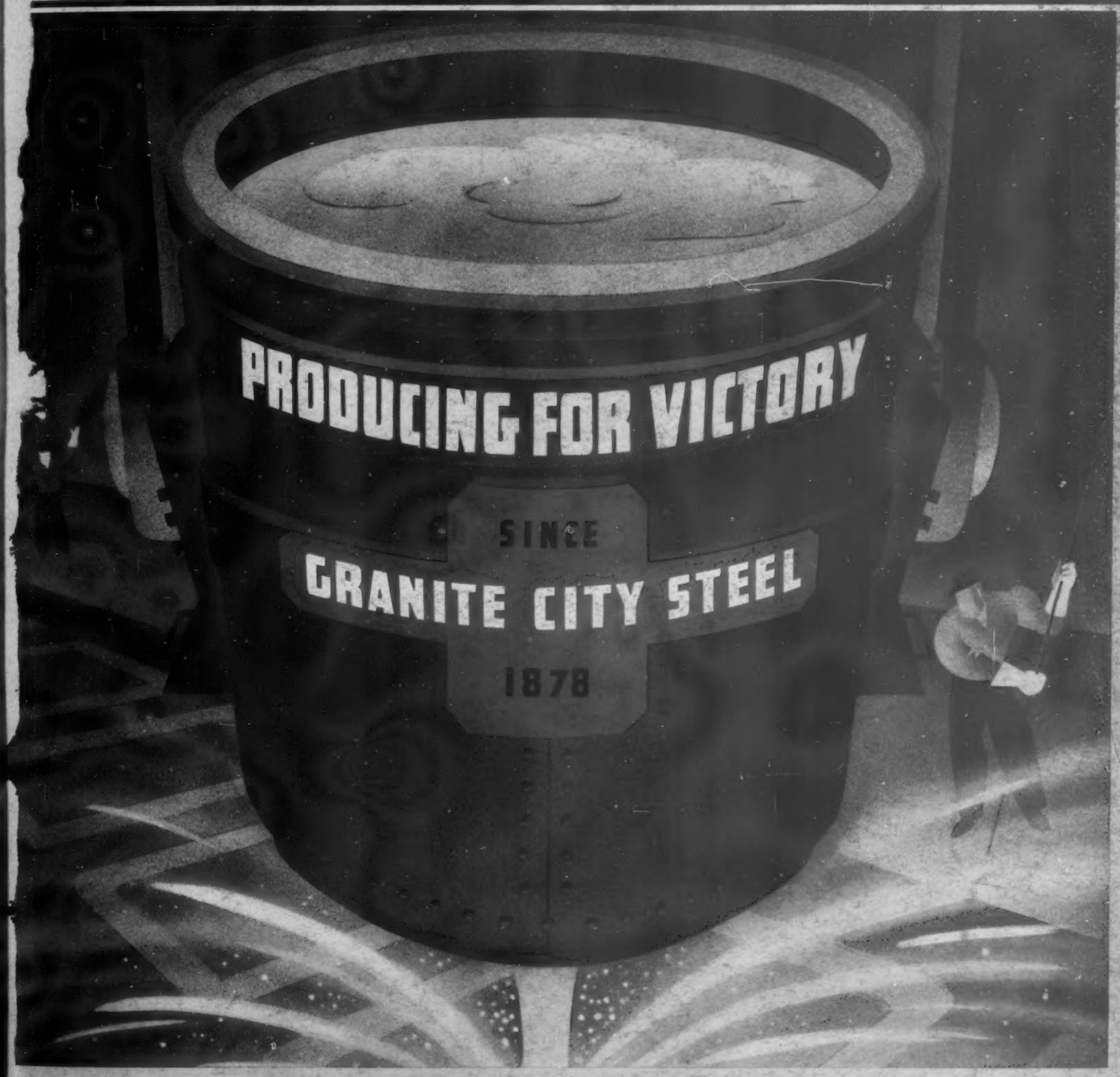
STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE
ESTABLISHED 1882



HOT ROLLED SHEETS • COLD ROLLED SHEETS • STRIPLATES • TIN PLATE
ELECTRICAL SHEETS • TIN MILL PRODUCTS • PORCELAIN ENAMELING SHEETS

GRANITE CITY STEEL COMPANY
GRANITE CITY, ILLINOIS

Chicago • Cleveland • Denver • Houston • Indianapolis • Kansas City • Los Angeles • Louisville • Memphis
Milwaukee • Minneapolis

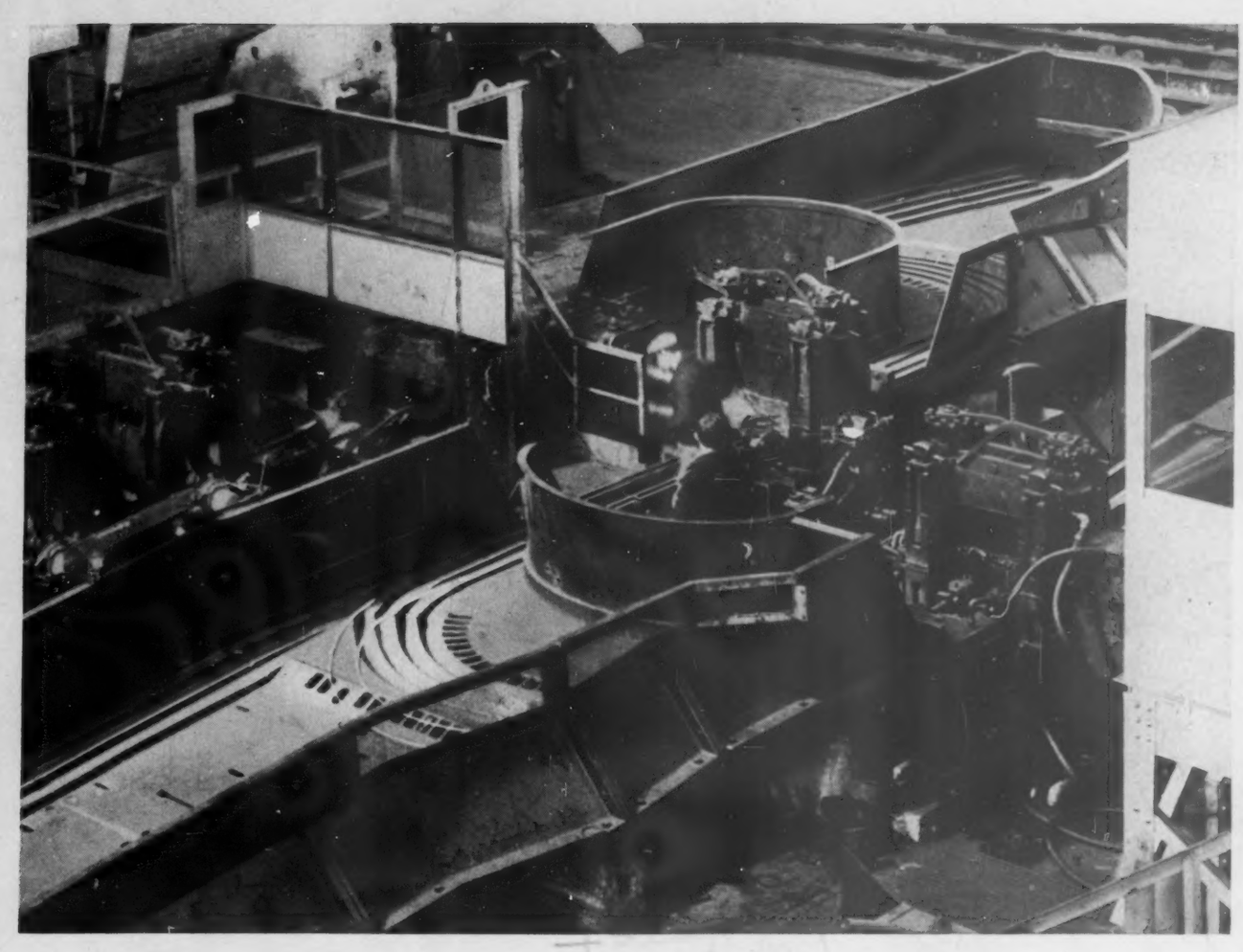
LODGE and SHIPLEY Put Airplane Quality Into Their Products

TODAY almost the entire Heald output of Bore-Matics is being used for precision finishing scores of parts for airplane engines to obtain the ultimate in accuracy and finish together with maximum production.

Four years ago while Lodge and Shipley were seeking similar quality for their lathes they also selected a Heald Bore-Matic. They tried it out on headstocks and tailstocks and the results, particularly in regard to alignment, were so satisfactory that they secured additional Heald Bore-Matics for numerous other parts such as control boxes, carriage aprons, quick change boxes, lead screw brackets, etc. Today these lathes are not only being built better, but what is more essential, faster than ever before, and in turn are being chosen to machine airplane parts since "Quality can best produce Quality."

If you have work that requires precision finishing let our engineers look over your problem and give you unbiased first hand information on how it can best be handled.

THE HEALD MACHINE CO., WORCESTER, MASS., U. S. A.



How an S-curve helps make better rods

To anyone not familiar with the fine points of making steel rods, it would probably seem absurd to break up a neat straight line of "roll stands" by an S-curve.

Bethlehem does it for a definite purpose:

There are 21 separate roll-stands in Bethlehem's modern rod mill. The rolls in each stand operate faster than their predecessors—from 6 r.p.m. in the first stand to 1500 r.p.m. in the last—a speed of about 3800 feet per minute. It is obvious that the speed of the many rolls must be perfectly synchronized or the rods will be "pushed" or "pulled" as they go through the mill.

By using multiple-motor drive, Bethlehem achieves unusually close synchronization. However, we go farther, and this is where the S-curve, which consists of two so-called "looping" stands comes into action.

The looping stands act as speed compensators. They reverse the direction of the rods twice, in the form of two U-bends or loops, before feeding the rods into the finishing stands. These loops are free to shorten or lengthen. By so doing, they absorb differentials in speed, give the rods a fresh start entering the seven finishing stands.

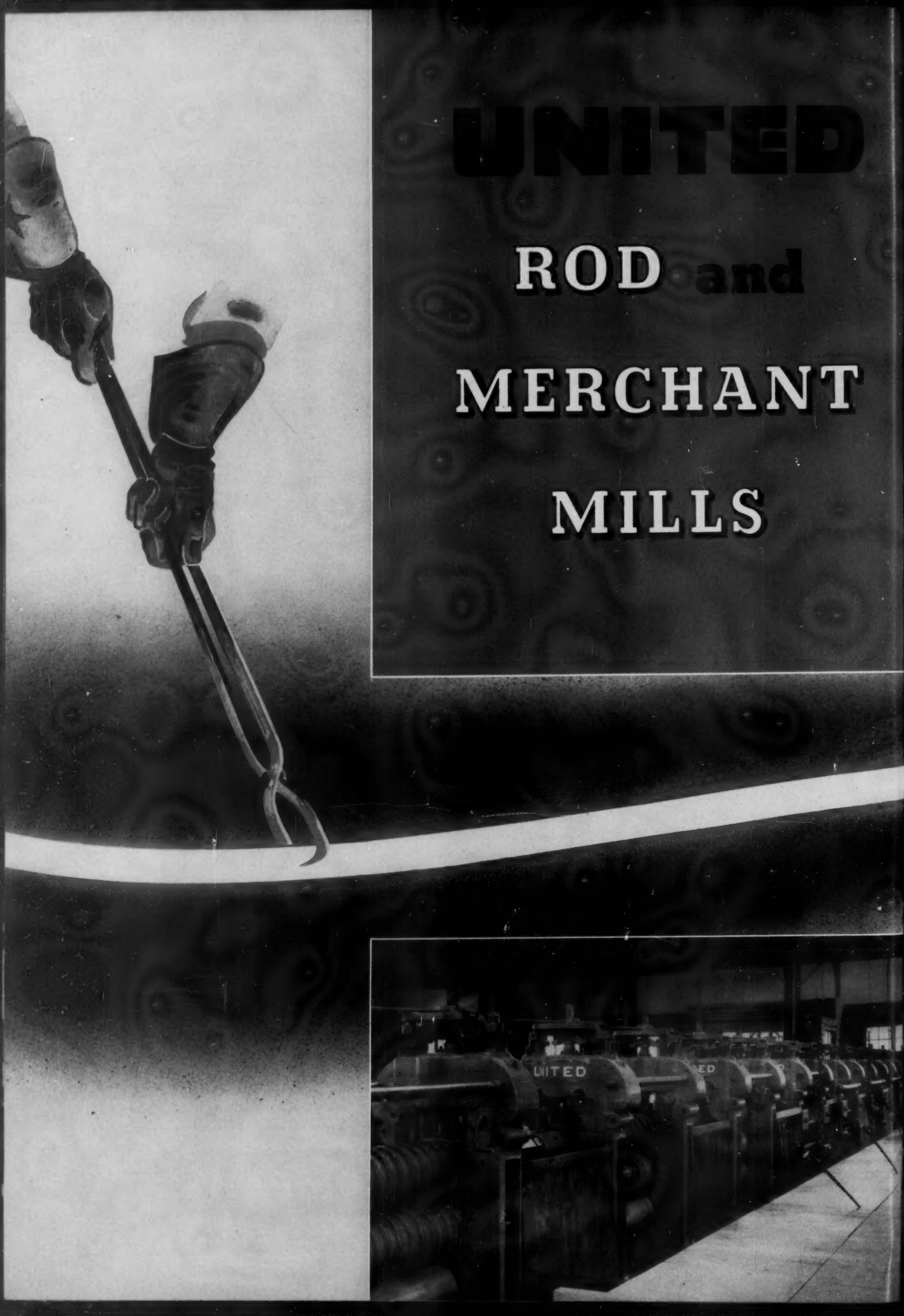
The looping stands help us to produce Bethlehem rods faster and better. Quality is not sacrificed to speed. Wire which is made from these rods is top-quality in every respect.

BETHLEHEM WIRE

This is one of a series of advertisements which illustrate and describe how Bethlehem Steel Company combines quality standards with utmost speed in producing top-quality rods and wire in the present crisis.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

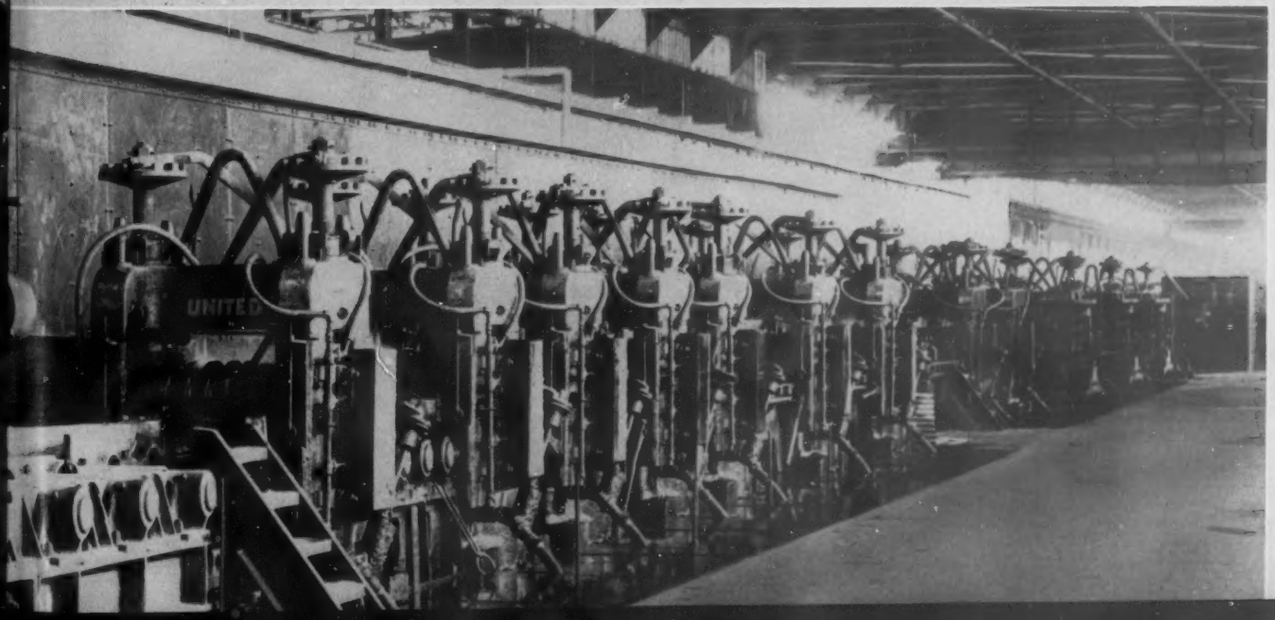

UNITED
ROD and
MERCHANT
MILLS

UNITED ENGINEERING *and* FOUNDRY COMPANY

Pittsburgh, Pennsylvania

DAVY AND UNITED ENGINEERING COMPANY, LTD., SHEFFIELD, ENGLAND · DOMINION ENGINEERING WORKS, LTD., MONTREAL, P. Q.

UNITED INTERNATIONAL, S. A. PARIS, FRANCE



Behind the Scenes with STEEL

Understatement

■ Latest definition of an optimist comes via Detroit, to-wit: An optimist is a guy who thinks 1942 is going to be a tough year!

Steel Is The Guts

■ The other day STEEL's Machine Tool Editor, Guy Hubbard, gave a little informal talk on business papers to the Cleveland Writers Club, and apparently did such a swell job he inspired Jessie Morris, one of the club's more active members, to rush right home to her typewriter. The result, which she brought down to Guy the next morning, is this poetic and forceful definition of steel:

Steel is the guts. Steel is the bone.
Steel holds the fabric that can't stand alone.

Steel is a girder, steel is a beam
Supporting the form of a builder's dream.

Steel is a needle, a plow in the earth.
Steel is a forceps to help a birth.

Steel is a compass. Steel is a knife.
Steel is a bullet to end a man's life.

Steel is a boxcar. Steel is a rail.
Steel is an instep when arches fail.

Steel is a bridge, a watch's spring.
Steel threads a harp so it can sing.

Steel is a tank, a plane in the air.
Steel is a pin in a woman's hair.

Steel is a buoy-bell, a sub underneath.
Steel is a brace on crooked teeth.

Steel is a cable, a ship on the deep.
Steel is a mattress where man can sleep.

From Life's first ante
Till it stops the wheel,
Man leans upon
The strength of steel.

For steel is the guts. Steel is the bone.
Steel holds the fabric that can't stand alone.

War Purchases

■ Looking over the invitations to bid on various Army and Navy requirements this past week, we realized all over again just how complicated modern warfare is. Needed was everything from 5 million pounds of wiping cloth to sewing machines, band instruments, laundry equipment, switchboards, flax twine and entrenching shovels.

On one item we were stopped cold. The purchasing officer of one of the Quartermaster Depots wants 208,000 *Thunderer Whistles!* If you know what those are we'll refund you the price of a penny post card letting us in on the know.

Gold-Plated Bikes

■ And looking over L-52, the new WPB order curtailing the manufacture of bicycles, you'll find the following statement under paragraph 5 which will probably leave you in about the same quandary it did us.

> **In general, bicycles may contain no metals other than iron, unalloyed steel, silver and gold.**

We suppose the next thing we know, Tiffany will be displaying bikes right along side their diamond brooches.

Boom Town

■ This story from Washington may give you some idea just how tough it is to get a place to live down there these days.

Mr. Smith, a newcomer to town, dejected at his failure to find a place to live, was strolling beside the Potomac when he heard a man crying for help.

He rushed to the drowning man and shouted: "What's your name and address?" "Jones", gasped the man with his next to last breath, and with the final one he revealed his address.

In no time at all, Smith was at the address, telling the landlord, "One of your tenants has just drowned. I want his apartment."

"Sorry," said the agent, "it was taken half an hour ago."

"But," protested Smith, "Mr. Jones only drowned ten minutes ago."

"I know," replied the agent, "I rented his apartment to the man who pushed him in!"

Peculiar Similarity

■ From a New England agency comes an editorial release various new and improved uses of staples, all of which was very interesting, but we were particularly intrigued by the part reading: Two products of similar type—brassieres and ear muffs—have also been made with staples.

Longest Word

■ Longest word in the Army's vocabulary is "trinitrophenylmethylnitramine", used as a booster charge in bombs and shells.

Call it "tetryl" and you'll be all right, although a courageous War Department official spelled it out twice in a press release recently.

Posters Available

■ If you want a few additional copies of the fold-out insert opposite page 44 this week for posting on your factory bulletin boards or in your office, STEEL's Readers Service Department will gladly furnish them free of charge. Just send your request to STEEL, Penton Building, Cleveland, an address you should get to know much better.

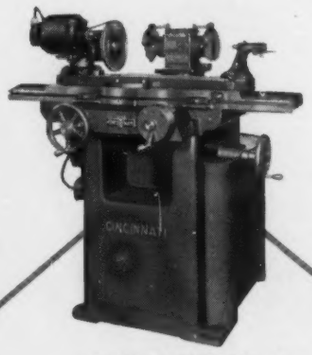
■ The American Supply & Machinery Manufacturers' Association is distributing a very snappy poster, too, reading:

Every Broken Tool Is A Break For The Enemy.

Vol. 110, No. 13, March 30, 1942, issue of STEEL, published every Monday at Cleveland, O. Entered as second class matter at the postoffice, Cleveland, O., under act of March 3, 1879. U. S. and possessions, Canada, Mexico, Cuba, Central and South America, 1 year $6; 2 years $10; all other countries, 1 year $12. Current issues, 25c. Yearbook of Industry issue, $2.00

Buy a Defense Bond—Today!

A Simple Calculation
WILL TELL YOU IF YOU HAVE ENOUGH CUTTER SHARPENING MACHINES



CINCINNATI No. 2
Cutter and Tool Grinder
Catalog M-962 contains complete description and specifications
Write for your copy

● From the broader viewpoint, cutter sharpening equipment occupies an important position in production. True, these machines merely sharpen cutters, but they constitute a link in the supply line that keeps the production line running.

A one-minute calculation will tell you if you have enough cutter sharpening equipment to keep your milling machines in operation: merely work out the ratio between the milling machines and cutter sharpening machines. About 15 to 1 (maximum) is satisfactory for light cuts on conventional metals, about 10 to 1 for general purpose work, and about 5 to 1 for heavy cuts or exceptionally tough materials.

Of course other factors may alter these ratios, but they will serve as a starting point in raising production which may be too low for the number of metal cutting machines at work. Check your cutter grinder equipment at the first opportunity don't let a ratio limit your production.

CINCINNATI

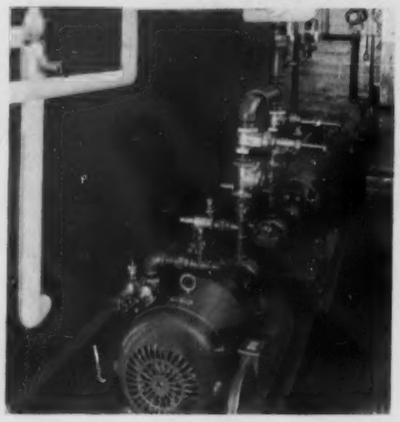
THE CINCINNATI MILLING MACHINE CO. CINCINNATI, OHIO, U.S.A.

TOOL ROOM AND MANUFACTURING MILLING MACHINES . . . SURFACE BROACHING MACHINES . . . DIE SINKING MACHINES

ROPER *Rotary* PUMPS

THE heart OF

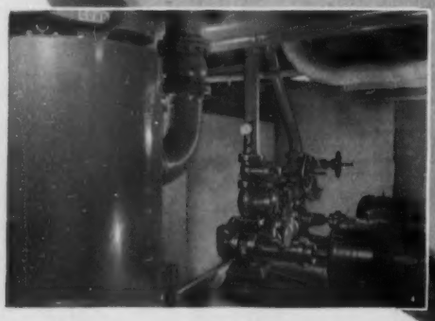
DEPENDABLE LUBRICATION SYSTEMS



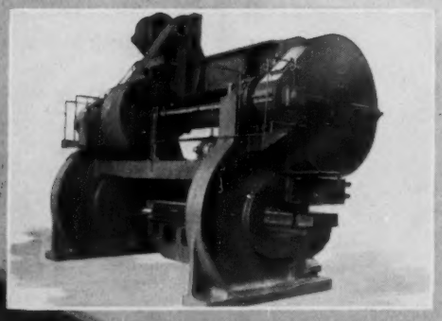
Installation of Roper Pumps in one of the "big name" steel mills. *Roper simplicity (only two moving parts) makes for efficiency.*

Giant gear drives; stand, rack and manipulator bearings; reversing tables; table rollers; moving parts of screw down mechanisms . . . all demand the safest and most dependable form of constant lubrication under pressure. Since 1927 most of the steel mills of this country have been equipped with Roper Rotary Pumps to handle these important jobs where failures must not occur.

Another installation of Roper Pumps in an oil cellar of a large steel mill. *Roper Pumps are easy to install, easy to service.*



Roper Pumps provide constant lubrication in this steel mill also. *Roper Pumps produce the ultimate in mechanical and volumetric efficiency.*



Roper Pumps provide a flood of lubricant for these Side Trimming Shears in a nationally known mill. *Roper Pumps are famed for low operating and maintenance costs.*

Write for Catalog No. 948

GEO. D. ROPER CORP.
ROCKFORD, ILLINOIS
PITTSBURGH OFFICE—207-209 BLV'D. OF THE ALLIES

This seal appears on every Roper Hydraulically Balanced Pump. It assures higher efficiency, quieter operation, greater dependability and longer life.

When applied to tin plate and allied lines of steel, the WEIRITE trademark is assurance to the buyer of a product uniform in gage, ductility and coating—a product which is a material aid to the customer in his development of profitable business.

Today, the word WEIRITE enjoys universal acceptance as a synonym of "unqualified quality"—an endorsement which accounts for Weirton's continued position as the world's largest independent tin plate producer—and one that is accepted wherever tin plate is used.

LIST OF PRODUCTS

Bars . . . Angles . . . Structurals . . . Piling . . . Hot and Cold Rolled Strip . . . Hot and Cold Rolled Sheets . . . Galvanized Sheets . . . Long Terne Sheets . . . WEIRITE Cold Reduced Tin Plate . . . Terne Plate —Special Coated and Roofing Ternes . . . Tin Mill Black Plate . . . Lacquered Tin Plate and Black Plate.

WEIRTON STEEL COMPANY—WEIRTON, WEST VIRGINIA

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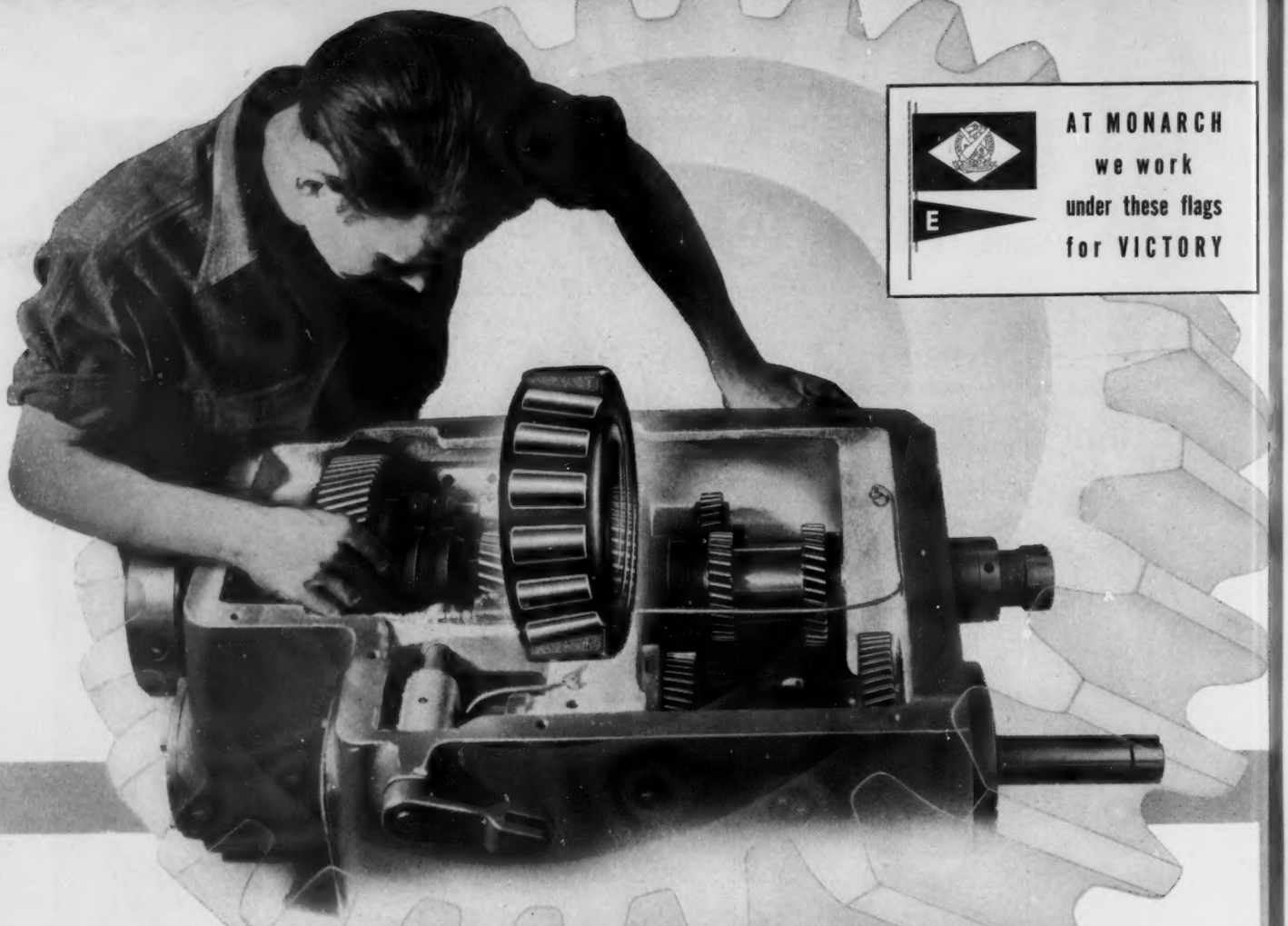
division of NATIONAL STEEL

NATIONAL STEEL CORPORATION

Executive Offices, Pittsburgh, Pa.



AT MONARCH
we work
under these flags
for VICTORY

ANTI-FRICTION BEARINGS

SPECIFIED BY THE *Phantom Gear*

Now more than ever before, owners and operators appreciate the value of anti-friction bearings in Monarch lathes. With machine tools working day and night to provide the implements of VICTORY, smoothness and power rank high in lathe requirements.

In Monarch equipment, the widespread use of anti-friction bearings throughout all major units speeds production, retains accuracy longer, reduces wear, and thus permits hard driving under severe conditions without bearing breakdowns.

The value of anti-friction bearings has been well proved through years of use. Like other important Monarch lathe improvements, they were inspired by the spirit which we call "*The Phantom Gear*," that is continually at work in our plant to design and build lathes that are more useful . . . will produce more . . . and will last longer.

★ ★ ★

It is this spirit that prompts Monarch today to produce more lathes than we ever thought possible even under emergency conditions. With no let-down in quality, we'll continue to deliver Monarch lathes to help supply the implements of VICTORY.

THE MONARCH MACHINE TOOL COMPANY • • • SIDNEY • OHIO

Monarch's March of Progress

Many of the most important advances in lathe design were first introduced by Monarch, such as:

Anti-friction bearings for all rotating parts

Helical geared headstock

Flanged spindle nose

Automatic force feed lubrication

Anti-friction bearing taper attachment

Flame-hardened beds

Automatic sizing for all size lathes.

These improvements have made the lathe a more useful tool, by increasing the scope of lathe work and making it more productive. For newest lathe developments, keep in touch with Monarch.

MONARCH LATHES

COVER THE TURNING FIELD

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STEEL
ESTABLISHED 1882

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PRODUCTION • PROCESSING • DISTRIBUTION • USE

He Can Help You to Meet
America's Greatest Scarcity

Scarcer than any industrial raw material or unit of equipment is the *time* required to put more power into our war machine. Time saved in industry means lives saved on the fighting fronts.

When it comes to "powering" arms-manufacturing equipment with all the necessary motors, motor controls, circuit breakers and switch boards, the GRAYBAR Power Apparatus Specialist can save you precious hours.

- His advice in ordering equipment avoids misfits and omission of needed accessories, while allowing your contractors or engineers to concentrate on installation work.
- In specifying, he can distinguish between the essential and the merely desirable, thereby avoiding many delivery delays.
- His recommendations for conversion and re-use of present electrical equipment in shifting to arms production work are based on broad-gaged experience on the power supply problems of many types of industrial plants.
- Close liaison between the GRAYBAR Specialists and the service engineers of public utility companies and equipment manufacturers quickly brings additional counsel into the picture when necessary.

The services of the GRAYBAR Power Apparatus Specialist... like that of GRAYBAR Specialists in industrial lighting ... signaling ... and other fields ... are among the "extras" you get as a regular customer of GRAYBAR. They augment the services of experienced local representatives... men whose job it is to bring the facilities of nationwide electrical distribution to bear upon your individual needs.

GRAYBAR *in over 80 principal cities*

Everything Electrical
*GraybaR ELECTRIC COMPANY
QUALITY SINCE 1869
* REG. U.S. PAT. OFF.

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GRAYBAR BUILDING
NEW YORK

HIGHLIGHTING
THIS ISSUE OF
STEEL

THIS week's conversion-to-war pictorial feature **(pp. 14-15)** deals with a firm that made steak "tenderizers" but now manufactures "bits and pieces" to fight the Axis. . . . Financing of war production by small companies was aided last week by executive and legislative action **(p. 22)**. . . . Donald M. Nelson opposed elimination of the 40-hour week **(p. 17)**. . . . Labor-management shop committees **(p. 16)** are being established by many manufacturers of war materials. Mr. Nelson warned labor unions that his proposal for such co-operation is not an invitation for labor to demand a voice in company management. . . . Posters are being used effectively to stimulate the will to win. STEEL presents an interesting one **(facing p. 44)**, extra copies of which are available. . . . Demands for more vigorous war effort, emanating from the grass-roots sections, constitute the war cry of the American people, declares E. L. Shaner **(p. 13)**.

• • •

Most general and blanket priority orders will be revoked or allowed to expire within the next several months in a general revision of the priorities system **(p. 27)**. More companies will be brought under the Production Requirements Plan and greater emphasis will be placed on the end use of materials. . . . WPB has established 13 regional offices in a decentralization program **(p. 19)**. . . . Problems of distributors and wholesalers will be simplified by a new form, PD-1X **(p. 28)**. . . . Loans and commitments by the Reconstruction Finance Corp. and its subsidiaries **(p. 29)** for war purposes exceed $11 billion.

Revising Priority Plan

• • •

National Steel Corp. **(p. 42)** reports its expenditures for new facilities in 1941-42 will total $30,000,000. . . . A $21,000,000 government-financed expansion project **(p. 21)** is begun by Alan Wood Steel Co. . . . Two more blast furnaces are to be built in Canada **(p. 43)**. . . . United States Steel Corp. **(p. 43)** is installing more electrolytic plating lines to save tin for vital needs; establishes a new subsidiary **(p. 43)** to concentrate on alloy steel tubing for war requirements. . . . Steel and wood replace aluminum in trainer **(p. 34)** planes, conserving 1250 pounds of light metal per plane. . . . Great production drives get under way in automobile plants **(p. 31)**. . . . Favorable weather and intensive drives brought out sufficient scrap to lift steel production 2 points to 97½ per cent **(p. 95)**.

New Steel Facilities

• • •

With no adequate source of rubber in sight, an explanation of what industrial plants can do to conserve the rubber at hand **(p. 50)** is especially valuable and timely. . . . Sheet steel bin-type retaining walls for earth and sand embankments **(p. 60)** offer effective protection against shell and bomb splinters. . . . A new cladding method **(p. 60)** lowers costs as much as 45 per cent and is extremely flexible. . . . C. L. Ipsen reviews some new electric furnaces **(p. 66)** that improve heat-treating. . . . A number of important developments in hot-coil conveyors **(p. 70)** are described by J. E. McBride. . . . A 10-week course in powder metallurgy **(p. 86)** is announced.

Lengthening Rubber Life

• • •

Many conversion opportunities for electroplaters are revealed in a list **(p. 65)** of typical present and suggested military uses of electroplated coatings. . . . S. S. Dewson explains **(p. 52)** how writing by wire can be important production aid under present emergency conditions when an instantaneous written form of communication between departments is vital. . . . A control system that maintains speed and tension in reeling strip is discussed **(p. 78)** by E. S. Murrah. . . . Clayton B. Herrick tells how to conserve welding electrodes **(p. 83)** and shows how various deviations from correct welding procedure affect the consumption of electrode material.

War Uses Of Plated Coatings

Men, Steel and MORE Steel

Men, steel and *more* steel point the way to victory. Men who build the machines of war—men who use them at the fronts. Steel that provides the machines which make the machines of war—steel that is giving American fighters the finest equipment on every battle front. Never before in the history of war has steel been so essential in quality and in quantity.

The capacity of American steel mills today is 88,000,000 tons—almost double that of the last war. New capacity now being constructed will add millions of tons in the very near future. The machine tool industry doubled its 1940 output in 1941, and enormous expansion is under way at this moment. This war is a race to make things *of steel, by means of steel.*

It is because of steel used in construction that munition plants of great size are completed in the shortest possible time. It is because of steel that our motorized armies, taking with them full equipment including great mobile field guns, move in less than an hour the distance covered in a day by General Grant. Better steels, in greater quantities have given us 60-ton, high-speed moving fortresses in place of low-speed, 6-ton tanks—bomb loads of 10,000 lb. instead of 40 lb.—machine gun fire of 1,500 rounds per minute in the place of 600—more air ships in a single month than we built during the first world war—and, because of steel we are building naval and merchant ships at the greatest pace ever undertaken by man.

Inland men are working day and night—the Inland mills are operating at capacity—new steelmaking facilities are being added—so that American industry and America's fighting men will have better steels, in greater quantity, to win this greatest-of-all mechanized wars.

SHEETS · STRIP · TIN PLATE · BARS · PLATES · FLOOR PLATE · STRUCTURALS · PILING · RAILS
TRACK ACCESSORIES · REINFORCING BARS

INLAND STEEL CO.

38 S. Dearborn Street, Chicago • Sales Offices: Milwaukee, Detroit, St. Paul, St. Louis, Kansas City, Cincinnati, New York

STEEL
March 30, 1942

THAT VOICE YOU HEAR IS THE AMERICAN WAR CRY

Dominating the news of the week was the widespread demand from the grass-roots sections of the country for a more vigorous war effort.

According to members of Congress, the letters received from constituents are critical of alleged selfishness by minority blocs, of unnecessary government expense, of excessive wages for workers or exorbitant profits for government contractors, and of waste and inefficiency generally.

This criticism has been greeted in several ways in Washington. Some senators and representatives have interpreted it as the spontaneous protest of ordinary citizens who now are thoroughly alive to the critical problems confronting the nation. Other congressmen and some persons in administration circles discount the furore on the ground that it has been stage-managed by selfish interests.

The President seems to be among those who discount the protests. He infers that at least part of the criticism has been sponsored by "sixth columnists."

In view of the manner in which all sorts of economic, political and social groups in the United States have functioned in the past, it is probable that a portion of the current wave of protest can be attributed to campaigns planned deliberately to arouse criticism of this or that activity or practice.

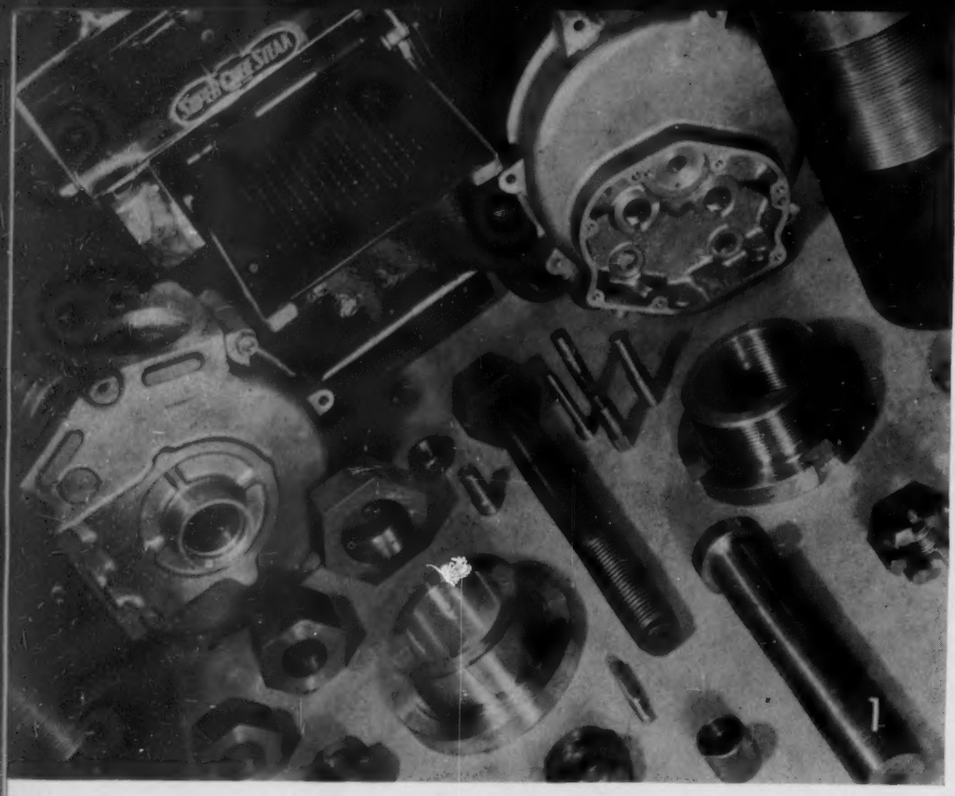
Nevertheless, to anyone who has kept his ear close to the ground outside of Washington, there is a new tone in this wave of protest which has no connection with the usual agencies of propaganda. It is free of any taint of fifth or sixth column influence.

It is the spontaneous indignation of men and women who are paying income taxes for the first time; of parents whose sons are in uniform; of persons in work shops, offices and stores who are prepared to make sacrifices; of common people everywhere who — now alert to the real situation — want action — quick, efficient action.

This is not a voice of carping criticism. It is not indignation to be decried or discounted. It is the war cry of men and women determined to win. It is the spirit for which everybody has been waiting.

In short, this ground swell of impatience with delay and inefficiency is the most wholesome sign since Pearl Harbor. It may mean that America will be awake in time to win.

E. C. Shaner
Editor-in-Chief



YOUR UNCLE SAM IS A BUSY MAN

. . . so don't make him take time to hunt up your production facilities. Use the same ingenuity and resourcefulness that you employed in starting your business to get into war work NOW while your efforts can still count in this critical year of 1942

PERHAPS YOU are worrying about priorities, how to get needed material to keep your plant going, how to substitute what you can get for what you can't get! Yet many manufacturers are overlooking the most important angle of the whole thing—the great need for production of war goods NOW, in 1942.

Your answer is—get into war production, keep your plant busy and help yourself, your business and your country. And you don't need a big plant with all sorts of equipment, for almost any plant can fit into the war production program somewhere. Sure, it may take some "phenagling" or a little "jiggery-pokery" as the British call it, but that merely adds spice to the job.

The same "Yankee push" that is credited with producing "bits and pieces" for war on the machines that make steak "tenderizers" for restaurants and hospitals can also help you in converting your plant facilities to war work. For aggressiveness in "selling" itself to prime contractors rather than any particular mechanical ingenuity was the key to enabling this small New England company to get war work. This plant is now handling 24 different war jobs under subcontracts from private contractors and government arsenals. The products, some of them shown in **Fig. 1,** range all the way from crank cases for motorcycles and heavy steel spouts used to make field guns, to small parts for a manufacturer of screw machines.

As a result of seeking subcontract war work energetically by giving prime contractors full information as to the company's facilities and products made now and in the past, the plant has nearly doubled the

number of workmen employed. Older men with their greater experience have been shifted to war work, while new men have been trained to take their places in some remaining production of steak "tenderizers" being supplied to post exchanges, hospitals and various other institutions.

In addition to adding employes, the company has had to purchase a second-hand turret lathe from a neighboring shoe manufacturer to handle the growing volume of war work. But most of the jobs are done on the company's regular equipment with such simple conversions as changing the size of drill and the workholding fixture on a drill press as in **Fig. 7.** The job of converting the lathe in **Fig. 3** from shaping wooden rollers used with a belt to carry steaks into the cube steak machine involved only a few hours' work to step up its speed and to tool it up to cut the spouts for antitank guns as shown in **Fig. 3.** The same operator as before now handles the new work.

A milling machine normally employed to cut steel disk covers for the cube steak machines is shown in **Fig. 2.** But by using two milling cutters as shown in **Fig. 6,** the machine has been converted to handle "hexing" of large nuts for a government arsenal. "Hexing" a nut is an extremely simple operation with a machine especially designed for that work, forming the hexagon shape in a single operation. Of course such a machine would do the job much faster, but there isn't time to wait for one to be built. So the operator uses the old milling machine and shifts the nut around in the fixture three times, cutting two sides at each position to finish the hexagon shape in three operations.

To thread these large hexagonal nuts, the company purchased a secondhand turret lathe from a nearby shoe factory. In **Fig. 4,** a workman is shown tooling up this lathe for the new work. The measurements of the tool hole in the turret are being checked against those of the specially-built tap which will do the threading. The chuck which holds the nut during threading is shown in **Fig. 5** with a 3¼-inch nut that has just been threaded by the tap in the background.

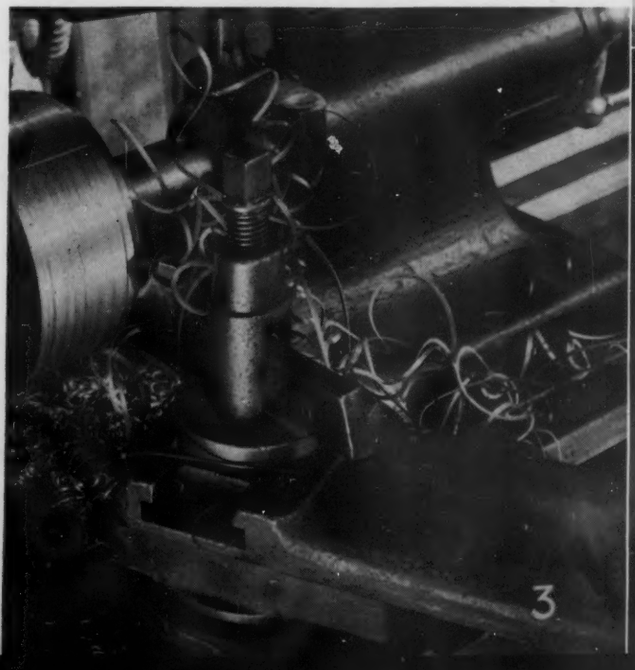
Any manufacturer who can benefit by having further details of this conversion job or who feels that he could make the conversion even more efficient or effective can get details from his nearest District Ordnance Office. Refer to WPB Release No. 316.

HERE'S HOW...

to get war work

Make a survey of your facilities—list equipment, types of skilled workmen, products that you already make. (See STEEL, Mar. 16, Page 59.)

Go to your nearest War Production Board Contract Field Office (see list in STEEL of Feb. 23, Section Two, Page 21). There you will be placed in contact with opportunities to get prime and subcontracts. But it's up to you to do the selling. Be persistent. Start NOW.



Joint Labor-Management Committees Established By Steel, Metals Firms

✦

War production chief warns labor leaders his proposal is no green light for union participation in policy formation . . . Employe suggestion systems gain acceptance

✦

MANAGEMENT and labor in the steel and metalworking industries are complying with War Production Chief Donald M. Nelson's request that joint shop committees be established to speed up war materials output.

Early suspicions regarding the proposal have been largely dispelled by clarifying statements by the WPB chairman.

Labor at first feared the plan might be used as a "speed up" device. Some union leaders attempted to interpret the proposal as substantially the same as the "Murray plan" to give the unions a voice in management and policy planning.

Management similarly was uncertain as to the scope of the proposed co-operation.

Mr. Nelson dealt with a CIO contention that his plan was a virtual endorsement of the Murray plan in addressing CIO leaders in Washington last week.

The plan, he said, "does not put management in labor or labor in management. It is not a management plan, a labor plan, or any other plan . . . It is a perfectly simple, straightforward effort to increase production."

Co-operative programs, similar to those proposed by the WPB chairman, have been in operation in many steel and metalworking plants for years. In some cases only slight revisions in these plans have been necessary to conform with Mr. Nelson's proposals. In other cases completely new committees have been appointed to remove obstacles slowing down output.

Establishment of the committees has been aided by a series of 31 conferences of labor and management representatives arranged by the WPB in important industrial communities. Before the conferences were scheduled the plan was tried out in 22 plants producing war materials and the results pronounced "successful" by WPB.

One example cited by the production board was the reduction in rejects of machine guns and automatic cannon in the Colt Fire Arms Co. plant from 17 per cent to one-tenth of 1 per cent. Union and management members of the committee discussed the high percentage of rejections and, on their own time, analyzed the matter and determined which processes were responsible for the rejections. Committee members visited the departments in which these processes were performed and arranged meetings of the workers. They pointed out how air power depended on fire power and how much fire power depended on the skill of their operations. The workers pledged unanimously to eliminate errors and the rejections decreased immediately.

The co-operative programs as instituted by most of the metalworking plants provide a means for channeling suggestions by workers to management to the end that inefficient and wasteful practices may be eliminated and short cuts developed.

Usually all workers are included, whether or not they are members of a union. In many cases, however, unions have been active in organizing the plan.

Weirton Steel Co., Weirton, W. Va., and the Weirton Independent Union were among the first to formulate

REGIONAL conferences to arrange joint labor-management committees to speed war production attracted large numbers of employes and employers in various industrial centers last week. Above view is a Cleveland group listening to a WPB official explain the plan. NEA photo

such a program. A committee of six employe representatives and six management reresentatives was appointed and named the "Production for Victory Committee of the Weirton Steel Co."

Weirton has placed suggestion boxes throughout the mills to enable workers to bring suggestions before the committee. Bulletin boards will be used for slogans and such other purposes as the committee determines.

Wheeling Steel Corp. and the Steel Workers Organizing Committee also have agreed on a production drive committee. A statement said the arrangement was for the sole purpose of intensifying the war production effort and "will in no way change, alter or abridge existing rights, responsibilities, duties or obligations of the SWOC and its members or of Wheeling Steel. . . ."

Douglas Aircraft Co., Santa Monica, Calif., has streamlined its six-year-old shop suggestion committee in line with Mr. Nelson's proposal.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has had a suggestion box system in effect for many years and has adopted and paid for more than 84,000 ideas from employes. Committees now being established will consider methods of increasing output, care of tools, avoidance of breakdowns, reduction of accidents, improvement of lighting conditions, adaption of old machines to new uses and reduction of wastage.

Western Electric Co., General Electric Co., Oldsmobile Division of General Motors, Doehler Die Casting Co., Radio Corp. of America and many other plants have been cited by WPB as having successful co-operative programs in operation.

For every 20 four-machine-gun fighter planes previously equipped. four more are now being supplied from one plant alone as a result of the War Production Board's production drive, the Division of Information, Office of Emergency Management, pointed out last week.

United Automobile Workers Membership at Record High

Average monthly paid-up membership of the United Automobile Workers-CIO for the six months ended October, 1941, was 489,827, highest ever attained, according to a report recently mailed to union locals by the treasurer.

Total income in the six months ended in October was $1,506,429, comparing with $1,267,147 in the previous six months. Summary of receipts and disbursements indicates an Oct. 1 ba'~nce of $609,178.

In his quarterly report to UAW-CIO members, R. J. Thomas, president, emphasizes the critical position of the country today, declaring, "We have a terrific and costly military struggle ahead of us. The Axis powers must be vanquished. The prospect of defeat for our nation is such a terrible one that we must, as American workers, make every effort to promote defense production, peacefully to adjust our differences with the employers, to subscribe—where possible—to defense bonds—in a word, to do everything possible to make certain that our nation is victorious."

Further on the no-strikes theme, Mr. Thomas observes, "While pressing for wage adjustments and other contract changes, our membership and local officers must keep uppermost in mind the fact that we are in a war, and the fact that the CIO and all its unions have given their solemn pledge that there shall be no strikes. It is the duty of every local union and member to support this pledge, both for the safety of our nation and for protection of our union against attacks by the enemies of labor who would most certainly use strikes during war time to destroy our organization."

Elimination of 40-Hour Week Opposed By WPB Chief; Fights Double-Time Pay

OPPOSITION to legislative action to eliminate the 40-hour week and time and a half for overtime was expressed last week by Donald M. Nelson, WPB chairman, in testimony before the House Naval Affairs Committee. Mr. Nelson, however, told the committee that double time for Saturday, Sunday and holiday work was a different matter and contended that organized labor's insistence on such payments has slowed down war materials production.

Closed shop demands should be sublimated to greater war production efforts, Mr. Nelson testified. He opposed outlawing the closed shop by Congressional action.

The WPB chief's appearance before the committee was in connection with House Resolution 6790, a bill to impose limitations on labor unions and to restrict profits on war contracts.

Mr. Nelson emphasized he was considering the bill only from the point of view of how it would affect war production at maximum speed and maximum volume. His testimony:

"The present law does not pre-

"WE'RE going to see to it that nobody pushes you around—but we're going to see to it that labor doesn't push anyone around either." It is War Production Chief Donald M. Nelson speaking, warning CIO representatives at a Washington meeting that he will not tolerate attempts by organized labor to capitalize on the war effort to promote selfish interests. Mr. Nelson, left, shown with Philip Murray, CIO president, at the meeting. NEA photo

vent men from working more than 40 hours per wek. It has not set the pattern for the length of the work week in our war industries. It governs wages rather than the hours in which a man may work. In the highly strategic machine tool industry, for instance, workers are putting in an average of 55 hours per week. In shipbuilding, the average is around 48 hours, and in aircraft it is approximately 49. For our war industries as a whole the average work week today is substantially above the 40-hour level.

"To abolish the 40-hour week law would not in my opinion bring any greater production or more sustained effort in war industry. On the contrary, I believe that such action would have a harmful effect on war production.

"The average war worker has, of course, been getting time and one-half for all hours worked per week in excess of 40. Our national wage structure has been adjusted to that fact. Most war contracts are drawn with that fact in mind—and where they are not, the use of escalator clauses prevents the time and one-half rate from operating as a drag on extension of the work week.

"If we now abolish the 40-hour week by law, we do not gain one hour of additional work in our war industries; but naturally we create a widespread demand for increases in wage rates, throw the entire wage structure out of adjustment, and remove an important incentive for labor to shift from nonessential industries into war production jobs. In addition, we would, in my opinion, make labor relations in general worse rather than better.

Opposes Double Time Pay

"The payment of double-time for Saturday, Sunday and holiday work is a different matter, which has no relation to the 40-hour week as such.

"What we are after is round-the-clock use of all available machinery, attained through the operation of three eight-hour shifts. I am in accord with the principle that the worker should regularly have one day off in seven; where emergency requires him to work on that seventh day I believe he should be paid overtime. But where his regular schedule of six days of work calls upon him to work Saturday, on Sunday or on a holiday, I do not believe that overtime should be paid for those days. It is the seventh day's work that should get overtime, not the Saturday, the Sunday or the holiday.

"I believe that this practice of demanding premium pay for week end and holiday work has in many cases slowed up war production. Yet I do not believe that we should try to correct this situation by act of Congress. I believe that we can gain a general suspension of this provision through voluntary action on the part of our responsible labor leaders; where that proves impossible, I can see no reason why the problem cannot be solved by the War Labor Board. I would not seek a remedy via legislative action unless both of those moves should fail.

"A third important provision of HR-6790 relates to the closed shop.

"Let me repeat; my interest is first, last and always in greater war production. In many cases the closed shop works very well and is a basis for mutually satisfactory relationships between labor and management. In such instances I am for letting well enough alone. I do not believe that the closed shop should be preserved in any case where its existence may be a direct hindrance to war production; but when such cases arise, I am satisfied that they can best be handled through the War Labor Board, which has been set up as a species of Supreme Court in regard to labor troubles.

"To outlaw all forms of the closed shop, as this bill would do, would appear to me very likely to have a bad effect on labor morale and on labor relations—and, ultimately on war production itself. Whether the closed shop is in itself a good thing or a bad thing, it has been built up in many industries, over a long period of years, through collective bargaining between employers and employes. I do not believe that the present is a proper time in which to disrupt that situation by act of Congress.

"The other important provision of this bill is the one which would limit profits derived from filling war contracts to 6 per cent of

Aircraft Engines Nine Months Ahead of Schedule

POWER for a four-engined bomber rolls off the assembly line at the Buick Motor Co. plant in Flint, Mich. Buick is nine months ahead of schedule in aircraft engine production. NEA photo

the cost of performing such contracts.

"With the attempt to keep war contractors from obtaining excessive profits I am thoroughly in accord. And it is my personal belief that 6 per cent profit is plenty in the average case.

"I should like to point out that very painstaking efforts have been and are now being made to analyze contract costs and make financial surveys in order to give us a clear picture of war contractors' profits. Many war contracts contain provisions by which prices may be renegotiated if it appears that the contractor is likely to gain an undue profit. Both the War Production Board and the War and Navy Departments do everything in their power to prevent unreasonable profits."

Mr. Nelson remarked that the profit limitation provisions might seriously hinder the efforts to convert small industries manufacturing civilian production to full wartime production. "Six per cent profit on a contract costing but $40,000 would not provide the shop owner with much incentive to get into war production."

Arnold Denounces Labor Unions for Abusing Powers

Organized labor was scathingly indicted for abusing its powers last week by Thurman Arnold, Assistant Attorney General, before the judiciary committee of the House of Representatives. Mr. Arnold approved pending legislation to require registration of unions and disclosure of their affairs and finances but held the bill was insufficient to protect the public.

Mr. Arnold accused the unions of a long list of misdeeds which he charged were preventing the efficient use of men and machines and preventing the distribution of civilian necessities.

Specifically his indictment included six counts: Exploitation of farmers, undemocratic procedure, including packing its membership to insure the outcome of elections; impeding transportation; making it impossible to get cheap mass production of housing; forcing businessmen to employ useless labor; restricting efficient use of men and machines.

He said state laws were inadequate to cope with the situation. Under existing federal laws, he continued, there is "no right of the farmer, no right of the consumer; no right of the small businessman which labor is bound to respect."

Mr. Arnold later was criticized for his indictment of labor unions by Attorney General Biddle who termed his remarks "pretty unfortunate at this time."

WPB Field Activities Decentralized; 13 Regional Offices Established

WASHINGTON

JAMES S. KNOWLSON, director of industry operations, last week announced plans for establishment of 13 regional WPB offices.

Existing 120 field offices will be allocated among the 13 regional offices for administrative purposes. This move constitutes another step toward the decentralization of WPB activities.

Mr. Knowlson also announced the appointment of the first three regional directors: Orville H. Bullitt, Philadelphia region; Ernest Kanzler, Detroit region; and John C. Virden, Cleveland region. Other regional headquarters cities will be Atlanta, Boston, Chicago, Dallas, Denver, Kansas City, Minneapolis, New York, San Francisco and Seattle.

"Our plan is to place as much authority as possible for WPB operations in these new regional offices," said Mr. Knowlson. "Other field offices now operating in 120 cities will become branch offices, and these will be administered by the regional directors. This will lead to more effective co-ordination of the service provided to the public through these branches. All of them are now offering advisory service on priorities and contract distribution, and their scope will be enlarged as the regional plan progresses."

"Determination of policies and programs will rest with the divisions of the WPB in Washington. But as time goes on, it is expected that more and more WPB activities will be actually directed in the field, in accordance with overall WPB policy."

Mr. Knowlson explained that special representatives of certain branches in Washington will be assigned to field work either in or through the regional offices, wherever a concentration of a particular industry or some specialized problem justifies their assignment. Management of regional and branch offices outside of Washington will remain in the Field Operations Bureau of the Division of Industry Operations of which Mr. Knowlson is the director.

"We want to bring WPB service close to home for both manufacturers and the various district procurement officials," he said, "and we believe the increased effectiveness of our field organization resulting from the creation of this regional setup will save much time and expense for business men, because they will be able to get more of the answers nearby and not have to come to Washington; in selecting regional directors, we are picking only men who have a firm grasp of war production problems in their areas."

Boundaries of regions have been drawn after a careful study of industry and trade areas, ordnance districts and existing regions of other government agencies. Following are the territories under the regional offices: Atlanta—Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Florida; Boston — Massachusetts, Connecticut, Rhode Island, Vermont, New Hampshire, Maine;

Chicago—Illinois, Indiana, Iowa, and the portion of Wisconsin lying south of a line running diagonally northeast from the junction of Wisconsin, Iowa and Minnesota to Marinette, Wis.; Cleveland—All of Ohio except the Toleda area, Kentucky, West Virginia, the western tip of Maryland, and western Pennsylvania, which includes Pittsburgh, Johnstown and Erie; Dallas—Texas, Louisiana, Oklahoma; Denver—Colorado, New Mexico, Utah, Wyoming;

Detroit — Lower peninsula of Michigan and the Toledo district in Ohio; Kansas City—Missouri, Arkansas, Kansas, Nebraska; Minneapolis — Minnesota, North Dakota, South Dakota, northern portion of Wisconsin (north of boundary line for Chicago region), and upper peninsula of Michigan; New York—New York state and portion of New Jersey north of Trenton; Philadelphia—Pennsylvania, except the portions included in the Cleveland region, Delaware, Virginia, the portion of New Jersey south of and including Trenton, all of Maryland except the western tip flanked by Pennsylvania and West Virginia; San Francisco—California, Arizona, Nevada; Seattle—Washington, Oregon, Idaho and Montana.

Knowlson Granted Authority To Delegate Rationing Power

J. S. Knowlson, director of industry operations, has been empowered by WPB Chairman Nelson to delegate WPB's rationing authority to the OPA in Amendment No. 1 to WPB Regulation No. 1.

This authority was previously delegated by the President to the chairman of the WPB. The amendment announced is purely administrative in nature, and means that the authority to delegate rationing powers may be exercised by Mr. Knowlson as well as by Mr. Nelson.

Salvage Chief Reports "Progress"; Says Intensified Drive Is Needed

SALVAGE of critical raw materials is making definite progress but a more intensified drive is necessary, George T. Weymouth, chief, Industrial Salvage Section, Bureau of Industrial Conservation, War Production Board, told 200 industrial salvage managers and executives at a meeting in Cleveland, last Tuesday.

He cited various instances of large quantities of steel and iron, nonferrous metals and paper recovered by industrial plants, indicative of possibilities from that source. He stated that 114,000 tons of steel had been recovered from automobile wreckers in Ohio this year. As an instance of how one industry can aid another he told of a steel company finding an accumulation of 40 tons of paper in its plants in addition to 125 carloads of iron and steel scrap. The mill receiving the paper salvaged 1800 tons of steel and iron scrap.

Walter L. Seelbach, Forest City Foundries Co., and president, Associated Industries of Cleveland, presiding, reported first returns of the industrial scrap collection, covering 75 companies, in one month included 3150 tons of iron and steel, 23 tons of brass, 14 tons of copper and four tons of zinc.

Mr. Weymouth pointed out that dislocation rather than actual shortage is the principal problem. Some companies attempt to retain accumulations, hoping to trade them for other material. Dan Gee, former vice president, Western Electric Co., Chicago, director of the Chicago regional office of the industrial salvage section, emphasized importance of delegating authority to the individual in charge of salvage in each plant.

Mid-West Scrap Dealers Name Price Control Body

A regional advisory committee for iron and steel scrap dealers of southern Ohio, Kentucky, southeastern Indiana and part of West Virginia was formed in Cincinnati last week at a meeting conducted by Edwin C. Barringer, president, Institute of Scrap Iron and Steel Inc., Washington.

The committee, appointed in conformity with price enforcement laws, includes Louis Silverman, Louis Silverman Co., Cincinnati; Sam Lapiro, Lapiro Bros., Cincinnati; Abe Byer, American Compressed Steel Corp., Cincinnati; George L. Sturm, Middletown Iron & Steel Co., Middletown, O.; Philip Moskowitz, Moskowitz Bros., Cincinnati; Henry D. Israel, Israel Bros. Co., Dayton, O.; Joseph Mansbach, Mansbach Metal Co. Inc., Ashland, Ky.; Mather Moffett, Summer & Co., Columbus, O.; Frank Kilcline, Luntz Iron & Steel Co., Kokomo, Ind.; Alex Levenstein, Levenstein Bros., Shelbyville, Ind.; Aaron Cohen, M. Cohen Co., Huntington, W. Va.; Lee J. Workum, Hickman-Williams & Co. Inc., Cincinnati; William J. Wolf, Wolf Co., Hamilton, O.; Sam Rosen, Acme Metal Co., New Albany, Ind.

Salvage Section Opens Office in Chicago

The new special projects salvage sections set up by the Bureau of Industrial Conservation, WPB, has opened an office in the Civic Opera building, Chicago, under supervision of Walter J. Malatesta, industrialist and banker. Appointed principal commercial representative for the Chicago area by Lessing J. Rosenwald, bureau chief, Mr. Malatesta says he has acted already to free quantities of potential scrap tied up for financial, legal or other reasons.

Texas Oil Fields Drive Nets 30,000 Tons Scrap and Rubber

Salvage of scrap metal and rubber by the Texas Mid-Continent Oil and Gas Association has resulted in collection of 28,000 gross tons, practically all from Texas oil fields, according to Charles F. Roeser, chairman of the committee directing the drive. Shipments to foundries and steel mills already total 500 carloads and 300 carloads will be shipped soon.

This material was gathered at 36 principal shipping centers and an equal number of collection points have not made full reports. When these returns are in it is believed the collection will be more than 30,000 tons.

Closes District Sales Offices for Duration

Central Iron & Steel Co., Harrisburg, Pa., is closing its district sales offices for the duration, effective April 1. District sales managers will be transferred to the general sales offices in Harrisburg. Concentration of all directive effort in Harrisburg, where general offices and mills are located, seemed advisable for efficient co-operation in the war program, the company stated.

Temporary relocation of district sales managers will not disrupt usual sale contacts, it was pointed out. Affected by the change are R. S. Maddocks and W. R. Baker, New York; R. H. McCracken and P. J. Driscoll, Philadelphia; E. S. Webster, Baltimore; W. H. Spooner, Boston. Mr. McCracken has been appointed assistant general sales manager.

Historic Cannon in "Salvage for Victory"

BOSTON: After playing an important part in the fortunes of the United States as part of armament on the frigate CONSTITUTION, this cannon will speak again in defense of the country. Last week it was auctioned on historic Boston Common for the benefit of the "Salvage for Victory" campaign. NEA photo

Alan Wood Steel To Add Plate, Ingot Capacity

A $21,000,000 government-financed expansion program at the works of Alan Wood Steel Co., Conshohocken, Pa., was announced last week.

The principal features include a 1200-ton blast furnace, three 150-ton open hearth furnaces, a battery of 57 coke ovens and a 120-inch tandem plate mill.

The plate mill will have estimated plate capacity of 150,000 tons yearly, compared with present estimated plate capacity of around 250,000 tons.

The new ingot capacity is calculated in some trade sources at 350,000 to 400,000 tons; present steel capacity is estimated at 660,000 tons.

Day & Zimmerman, Philadelphia, are engineers in charge. The work is scheduled for completion in 18 months.

February Plate Output Exceeds Rated Capacity

While production of finished steel in February was below that of January, because of the shorter month, platemakers increased output over January, the American Iron and Steel Institute reports. February output of steel for sale was 5,097,353 net tons, compared with 5,575,666 tons in January, total for two months being 10,673,019 tons.

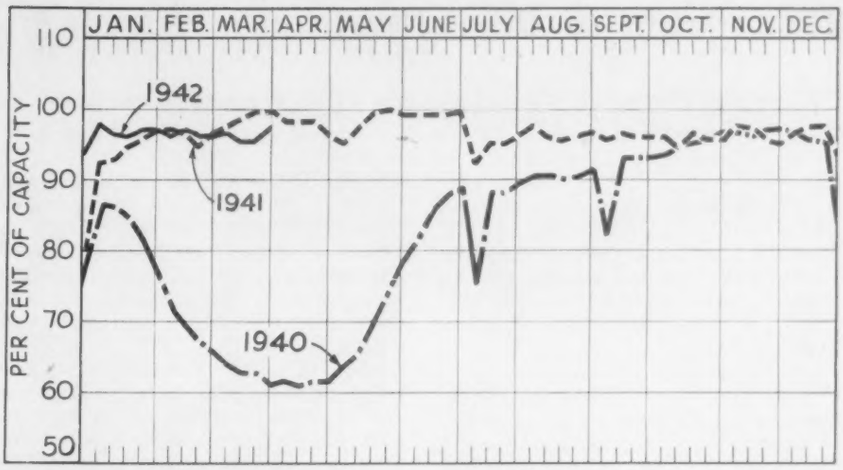
Rated capacity for sheared and universal plates is 7,101,320 tons annually but in February plate production was 734,656 tons, 134.8 per cent of capacity. Plate output in January was 713,197 tons, the total for two months being 1,447,762 tons.

Black plate capacity is 342,100 tons annually. February production was 57,114 tons, 217.6 per cent of capacity.

Illinois Freight Rate Increase Suspended

Illinois Commerce Commission last week suspended railroad freight rate increases previously ordered to take effect on intrastate traffic April 13. The proposed increases conformed to the recent ICC interstate rate orders, ranging from 3 to 6 per cent.

Three shipper groups had protested specific advances in Illinois, and had been granted adjustments. The broader decision is interpreted to mean the entire rate question will be reviewed. April 7 was set for hearings.



PRODUCTION . . . . Up

PRODUCTION of open-hearth, bessemer and electric furnace ingots last week rose 2 points to 97½ per cent, a result of better scrap supply. Six districts advanced, three declined and three were unchanged. A year ago the rate was 99½ per cent; two years ago it was 61 per cent, both computed on the basis of capacity as of those dates.

Chicago—Steady at 104 per cent in face of slight scrap margin. Two producers increased, three were unchanged and one receded fractionally.

Cincinnati—Increased 5 points to 92 per cent as one interest completed resumption after being down for repairs and additions.

Detroit—Advanced 10 points to 93 per cent as Ford Motor Co. added three open hearths on improved scrap supply.

St. Louis—Unchanged at 83 per cent with 23 of 28 open hearths in production. A higher rate is scheduled for this week as scrap supply increases.

Youngstown, O.—Removal of an open hearth at Republic Steel Corp.'s Warren, O., plant reduced production 1 point to 94 per cent. The same interest will take off another furnace this week, reducing the rate to 93 per cent. Lack of scrap caused both declines.

Cleveland—Slight reduction at one plant lowered the rate 1½ points to 89½ per cent. The loss will be recouped this week.

Birmingham, Ala.—With 23 open hearths in production the rate is unchanged at 95 per cent.

Central eastern seaboard—Better scrap supply caused an increase of 2 points to 90 per cent.

New England—Furnace repairs curtailed production 20 points to 80 per cent of capacity.

Pittsburgh—Gained 2 points to 96 per cent as scrap receipts increased. Blowing in of Carrie No. 4 blast furnace left Duquesne No. 3 the only stack idle in the district, 44 of 45 being in blast.

Wheeling—Up 1 point to 82½ per cent.

Buffalo—Greatly increased scrap supply allowed idle open hearths to be lighted and lifted the rate 13½ points to 93 per cent. This is the highest rate since October.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Mar. 28	Change	Same week 1941	Same week 1940
Pittsburgh	96	+ 2	103	57.5
Chicago	104	None	101.5	56.5
Eastern Pa.	90	+ 2	96	59
Youngstown	94	— 1	97	43
Wheeling	82.5	+ 1	83	71
Cleveland	89.5	— 1.5	99.5	69
Buffalo	93	+13.5	93	44
Birmingham	95	None	90	78
New England	80	—20	85	65
Cincinnati	92	+ 5	97.5	45.5
St. Louis	83	None	99	39
Detroit	93	+10	95	79
Average	97.5	+ 2	*99.5	*61

*Computed on steelmaking capacity as of those dates.

Nonessential Bus Service Restricted by ODT Order

To conserve buses and bus equipment for transportation of troops and for essential civilian passenger movements, the office of Defense Transportation, has issued a general order prohibiting local transit and railroad companies from substituting bus service for street car or train service on existing rail routes, unless authorization for the substitution is granted by the ODT.

Financing of War Production Eased by Executive, Legislative Proposals

WASHINGTON

PRESIDENT Roosevelt has issued an executive order whereby the War and Navy Departments and the Maritime Commission may guarantee or make loans for war production by small businesses and subcontractors.

Basic purpose of the order under which loans will support operations of the banks, Federal Reserve System, RFC and other credit agencies, is to put working capital financing on a wartime basis. Up to the present time peacetime restrictions on banks and credit agencies have made it difficult for them to finance war production although banks have been anxious to use their resources for prosecution of the war. These guarantees will not be made under peacetime credit rules and will be made by production men wherever additional financing is essential for additional production.

Under terms of the order the War and Navy Departments and the Maritime Commission are authorized to enter into contracts with the Federal Reserve Bank, the RFC or any other financing institution guaranteeing these organizations or other financing institutions against loss of principal or interest on loans, discounts or advances or on related commitments which may be made by such groups for the purpose of financing any contractor, subcontractor or others engaged in operations deemed essential to the prosecution of the war.

Approves $100,000,000 Bill

Bill designed to help small plants and industries share in war production has been approved by the Senate Banking Committee. A $100,000,000 fund to finance the program also was authorized.

Final draft of the measure calls for a "smaller war plants corporation." Members of the committee said Secretary of Commerce Jones sought to control the new agency but that the committee rejected its proposed amendments and accepted the suggestion of Donald M. Nelson, chairman of WPB.

The proposed corporation would receive its $100,000,000 capital from the treasury and would act as prime contractor on war orders and then subcontract these to small plants.

Senator Taft, Ohio, and a member of the Small Business Committee, which sponsored the legislation, said the plan should be successful if Mr. Nelson finds a good man who can co-ordinate the whole program.

The new corporation will be a division of the War Production Board. It will provide funds for retooling small industry and financing subcontracts. Its five directors would be appointed by Mr. Nelson. The Reconstruction Finance Corp. would be limited to servicing and collecting loans.

poses—the "K" company has steadily increased the number and size of its war orders. At present its engineers are planning how to utilize the plant's equipment for the production of 37-Millimeter gun carriages for Army ordnance.

In converting from commercial to war production work, the firm has added a Magniflux machine to detect flaws in metal, three new milling machines, and other tools. It has gradually reorganized its plant layout and is installing two diesel engines to add to its present power plant of four diesel engines.

The firm's machine equipment includes: 14 turret lathes, 13 engine lathes, 18 drill presses, 14 milling machines, 11 grinding machines, 8 gear cutting and gear hobbing machines, and three heavy duty planer miller machines, and, in addition, such supporting machines as power hack saws, metal band saws, forges, metal sprayers.

Vice President in Charge, Westinghouse Sales

B. W. Clark

B. W. Clark, vice president in charge of Westinghouse Electric & Mfg. Co.'s merchandising division, has been appointed vice president in charge of sales, succeeding Ralph Kelly, who has resigned to become executive vice president, Baldwin Locomotive Works. He will transfer his headquarters from Mansfield, O., to Pittsburgh. Engaged in electrical wholesaling and merchandising 35 years, Mr. Clark is also president, Westinghouse Electric Supply Co.

Outlines Way for Iron and Steel Price Adjustments

Provisions whereby producers of iron and steel products may seek adjustments or exceptions to Price Schedule No. 6 covering these products are incorporated in Amendment No. 2 to the schedule, issued last week by OPA.

Petitions for relief are to be filed in accordance with provisions of procedural Regulation No. 1, issued by OPA.

Producers must show that cost of production is above mill net realization on such products at ceiling prices, or that mill net realization is inadequate in view of high operating costs for continued operations at ceiling prices, in order to seek an adjustment.

OPA may require full data on costs, profits and other relevant factors.

Exceptions also may be asked in the case of products necessitated by the war effort and involving shipment into areas not normally served or where absorption of abnormally high transportation costs result from lack of customary means of transportation.

South American Students Visit Steel & Wire Plants

Eight young South American engineers, in this country under supervision of the Rural Electrification Adminitsration, last week visited Cleveland plants of the American Steel & Wire Co. They are being schooled by the REA in rural electrification for the purpose of establishing similar projects in Latin American republics.

The visitors paid particular attention to the vibration laboratory, which is said to be the only one of its kind in the country. It is suited to many problems incident to rural electrification.

International Harvester Co. will manufacture army materials in the Ostrander-Seymour Co. plant, 1874 South Fifty-fourth street, Cicero, Ill., which has been purchased by the federal goverment, leasing it to Harvester.

REVISIONS AND ADDITIONS TO

PRIORITIES—ALLOCATIONS—PRICES

as published in Section Two of STEEL, Feb. 23, 1942

M ORDERS

M-15-b (Amendment): **Rubber,** effective March 31, 1942. Bans use of reclaimed rubber except for manufacture of products for which crude rubber or latex permitted; for manufacture of a specific list of products, amounts so issued to be determined by a specific formula; for April only for manufacture of another specific list of products. After April 30 specific allotments of reclaimed rubber will be made. Reclaimed rubber use in filling war orders prohibited unless reported to WPB.

M-18-b: Chromium, effective March 26, 1942. Bans use of chromium in manufacture of roofing materials, ceramics, soap and glass. Chromium pigment use restricted to 90% of amount used in year ended June 30, 1941. Manufacture of chromic acid restricted to 80% of base period rate; chromium use for leather tanning restricted to 90%; all other uses as chemical restricted to 100% of base period.

M-24-a: Scrap, effective March 24, 1942. Prohibits sale of shipment of tinned scrap in any one of 27 specified California counties, except to a broker or dealer, or to a detinning plant or copper precipitation plant in those counties. Detinned scrap produced in those counties may be sold or shipped only to copper precipitation plants.

M-43-a (Amended): **Tin,** effective March 17, 1942. Adds various government agencies to list of those prohibited from using tin for certain purposes. Restricts lead base alloy other than solder to 12% tin content. Tin content of solder limited to 38% until May 1, 1942; 30% thereafter. Collapsible tubes limited to 7½% tin content. Virgin tin banned in making or treating type metal. Tin in terne for terne plate limited to 15%, for long ternes to 10%. Manufacturing jewelers required to report to WPB inventories of white metal, tin and other tin-bearing metals. National Lead Co. designated to purchase such stocks at prices fixed by WPB.

M-57 (Amendment): **Tung Oil,** effective March 13, 1942. Permits manufacturers to dispose of tung oil stocks they are not permitted to use, by selling to consumers for a permitted use.

M-59: Palm Oil, effective March 20, 1942. Restricts use to manufacture of tin plate, terne plate, long ternes and steel sheets and strip; also for manufacturing processes in which glycerine is produced, provided amount of glycerine remaining in the product does not exceed 1½%. Persons holding more than 30,000 pounds of palm oil must report inventory to WPB by April 15, 1942, on PD-355.

M-60: High Lauric Acid Oils, effective March 20. Prohibits use of such oils which do not produce glycerine, or in which amount of glycerine remaining exceeds 1½% on an anhydrous soap basis.

M-108: Can Enamel, effective March 23, 1942. Prohibits use of enamel on exterior of can ends, except to protect printing which designates contents or to coat ends made of electro-plated sheet or untinned material. Sale of enamel for prohibited purposes also banned.

M-110: Molybdenum, issued March 18, 1942, effective May 1. Covers all forms, including scrap. Provides for complete allocation of supplies. Buyers file PD-358 and PD-359 with WPB by 20th of month before the month in which delivery is desired. PD-360 is filed with WPB and with supplier to apply for delivery. Consumers ordering less than 50 pounds per month not required to file reports and applications.

M-113: Boxes for Can Makers and Canners, effective March 23, 1942. Revokes inventory restrictions of Priority Regulation No. 1 insofar as they apply to seasonal demand of canners and can manufacturers for packing boxes.

P ORDERS

P-25, 26 (Extension): **Military Tanks,** effective March 16. Orders covering both the P-25 and P-26 series extended to May 31, 1942. Before latter date producers must apply for preference ratings under the Production Requirements Plan.

P-100 (Interpretation): **Maintenance, Repairs, Operating Supplies,** effective March 23. Directs that durable office equipment may not be ordered with preference ratings assigned under this order.

P-120: Aluminum and Magnesium Plant Operations, issued March 20, 1942. Covers producers and basic fabricators of aluminum and magnesium on orders for plant repairs, maintenance and operating supplies, applicable only when specifically assigned to an individual company by WPB. Companies wishing to operate under P-120 apply for serial numbers on PD-371 and must file quarterly reports of use of ratings on PD-372. Assigns A-1-a rating for materials required in event of actual breakdown; A-1-c to materials required to avert breakdown; A-1-j to other materials. Suppliers may extend A-1-a or A-1-c rating only if unable to fill order from inventory. When filled from inventory supplier may use A-1-j rating to replace material in stock.

L ORDERS

L-33: Portable Electric Lamps, Shades, effective March 23, 1942. Until April 30, 1942, production and metal consumption limited to 70% of average 1940 rate; limit is 60% thereafter. Nonferrous metals may be used only for sockets, switches, plugs and lamp cords, except parts in stock March 23 may be used for ensuing 30 days.

L-42 (addition): **Plumbing and Heating Simplification,** effective April 1, 1942. Schedule V lists specific plumbing fixtures which may be made of copper, copper-base alloy or die-cast zinc.

L-49: Beds, Bed Springs, Mattresses, effective March 20, 1942. Manufacturers who consumed 500 tons or more of steel in the year ended June 30, 1941, required to curtail use during second quarter of 1942 by 35 to 60%, depending on the product. Those using 100 to 500 tons of steel in the base period required to cut consumption 25 to 50%. Smaller interests required to reduce steel use 15 to 40%.

L-54-a: Office Machinery, effective March 17, 1942. During period March 15-May 31, five largest manufacturers of typewriters required to cut production of standard models 25% below 1941 average monthly sales. Woodstock Typewriter Co. must cut output 10%. Reductions for June are 47% and 25%, respectively. Production of portable typewriters cut 64% through May 31, 89% in June. Manufacturers required to set aside 68.5% of their output of standard models and all portable models for the Army and Navy, 31.5% for distribution according to WPB instructions. Stocks in manufacturers' hands also must be held for WPB rationing.

L-59: Metal Plastering Bases, effective March 25, 1942. Producers of metal lath and other plastering bases and accessories who used 14,000 tons or more of metals in 1941 required to cut metal consumption 50% below 1940-41 average rate. Zinc use cut 65%. Small producers cut all metals 25%, zinc 50%.

L-62: Metal Household Furniture, effective March 20, 1942. After May 31, 1942, production of furniture containing more than 5% of metal by weight (other than nails or other joining hardware) prohibited. Until May 31, iron and steel consumption by larger manufacturers must be cut 45% to 65% below average rate in year ended June 30, 1941. Smaller manufacturers must cut consumption 30% to 50% and permitted to use not over 23 tons in March, 19 tons in April, 16 tons in May.

L-71: Flashlights, effective April 1, 1942. Bans use of aluminum, chromium or nickel in making cases or batteries. Tin may be used only in solder, iron and steel only in reflectors, contact fittings, battery top seals, battery outer jackets, rivets, end caps and end ferrules.

L-72: Razors and Blades, effective March 25, 1942. Safety razor production ensuing 90 days limited to 70% of average rate in 1940; production of blades and straight razors limited to 100% of 1940 average rate. Copper consumption in making safety razors ensuing 60 days limited to 30% of 1940 average rate; thereafter copper use restricted to plating not over 0.0004-inch thick.

L-77: Metal Windows, effective March 25, 1942. Restricts production of metal window framework to orders having better than A-2 rating, unless manufacture started before March 25. Sales limited to orders having A-10 or better rating.

PRICE SCHEDULES

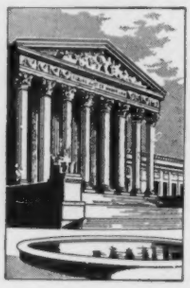
No. 108—Nitrogen Fertilizing Materials, effective March 23, 1942.

No. 109—Aircraft Spruce, effective April 1, 1942. Maximum prices vary up to $690 per 1000 board feet, plus extras when the lumber is kiln dried.

For additional revisions and additions please see STEEL of March 2, p. 39, March 9, p. 38, and March 16, p. 39, March 23, p. 35.

Windows of *WASHINGTON*

Utilities maintenance and repair order revised, ratings raised . . . Production of razors and blades limited . . . Manufacture of large metal signs to be prohibited after July 1 . . . Palm oil consumption restricted but will continue to be made available for making tin and terne plate, steel sheet and strip . . . Metal household furniture output pared down by War Production Board



By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

WPB has issued a complete revision of Preference Rating Order P-46 which was issued last September to assist utilities in obtaining the minimum amount of materials necessary for maintenance, repair and operation.

New order supersedes the original order and all amendments thereto and makes several important changes, the principal of which are:

The blanket rating of A-10 in the original order is replaced by two higher ratings. An A-2 rating is granted to deliveries of material for maintenance, repair and operating supplies for power plants and pumping plants. An A-5 rating is granted for all other facilities, such as lines, pipes and substations. One of the reasons for the distinction is that if a power plant or a pumping station breaks down, the whole system is put out of business. If a power line or a water pipe breaks, only a part of the system is affected. In either case, the rating is high enough to make possible prompt repair.

The order also assigns a rating of A-5 to deliveries of materials to bring electricity, gas, or water to war plants or other projects—bearing a rating of A-5 or better. This does not apply to housing projects. An A-5 rating is also granted to deliveries of materials needed to protect power or water plants against sabotage such as fencing, tear gas bombs for guards around such plants, etc. These ratings may not be applied without prior authorization from the WPB Director of Industry Operations.

Line extensions to serve a new consumer are restricted to 250 feet. The original order permitted a 1000-foot extension. Extensions begun prior to March 26, the date of issuance of this order, may be completed.

Production of Razors, Blades Curtailed by WPB Ruling

Curtailment of the production of safety razors, straight razors and razor blades has been ordered by the WPB to save valuable metals.

Dry shavers were not included in the order, L-72, as they will be taken care of in another order to be issued soon.

Monthly production of safety razors during the next 90 days is restricted to 70 per cent of monthly average production in 1940, when the year's total was about 12,000,000.

Monthly production of blades, both double and single-edged, is limited to 100 per cent of the monthly average production in 1940. This will make available an average of a blade per shaver.

Monthly production of straight razors is limited to 100 per cent of the monthly average production in 1940.

In addition, the use of copper in the razors permitted under the order is sharply restricted. During the first 60 days of the 90-day period the monthly use of copper is restricted to 30 per cent of the monthly consumption in 1940. Thereafter, no copper may be used except a small amount for plating, the plating not to exceed an average thickerage thickness of .0004 inch.

Manufacture of Large Metal Signs Banned After July 1

Manufacture of signs 36 square inches in size or larger and containing 5 per cent or more metal by weight will be prohibited after July 1. Affected will be construction and installations of billboards, electric signs, and store-front signs, and electrical equipment for such displays.

Manufacturers will be permitted to use from April 1 to July 1 iron and steel at a rate of 50 per cent of the amount used during the same period in the year ended June 30.

Inventories of raw and semi-processed iron and steel in the hands of manufacturers are frozen and may be sold only with the consent of WPB to fill orders bearing a rating of A-3 or higher, or to the Defense Supplies Corp., Metals Reserve Co., or other agency of the Reconstruction Finance Corp.

Minimum Weight Limits Established for Lcl Loadings

To release box cars and other railroad equipment for the movement of war materials, the Office of Defense Transportation has established minimum weight limits, beginning May 1, on loadings of cars carrying less-than-carload civilian freight. At the same time, rail carriers were directed to submit to the ODT plans for individual or joint action to curb wasteful use of freight cars in the handling of merchandise.

In the first general order issued since creation of the ODT a minimum weight limit of 6 tons was fixed, effective May 1, on loadings of cars containing less-than-carload freight, commonly known as merchandise freight. The order raises the minimum allowable weight to 8 tons per car on July 1, and to 10 tons per car on and after Sept. 1.

Loadings of merchandise freight in 1941 averaged 5.3 tons per car on intercity routes and 2 tons per car on movements within terminal districts.

Metal Lath Production May Be Curtailed by WPB

Methods of saving substantial amounts of sheet steel by curtailing production of metal lath and accessories were discussed recently at a conference with the industry called by the WPB Building Materials Branch.

Representatives of the WPB Iron and Steel Branch pointed out that pressure on the supply of steel sheets in the last few months had increased sharply due to the change-

CASE "A"
Reduction of 64% in man hours in one single operation

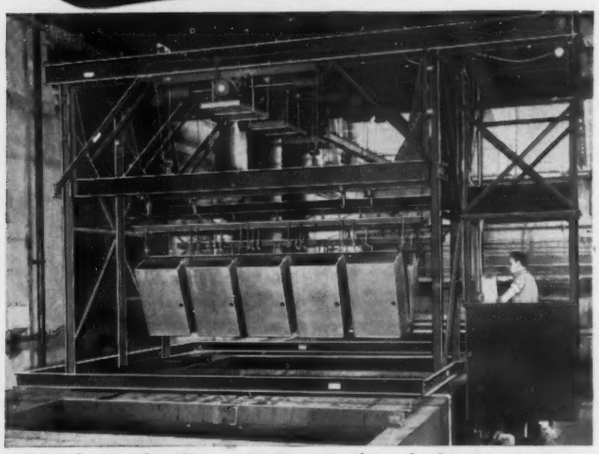
CASE "B"
Increase from 20 to 80 tons of steel handled in one day

CASE "C"
Production increased **30%**

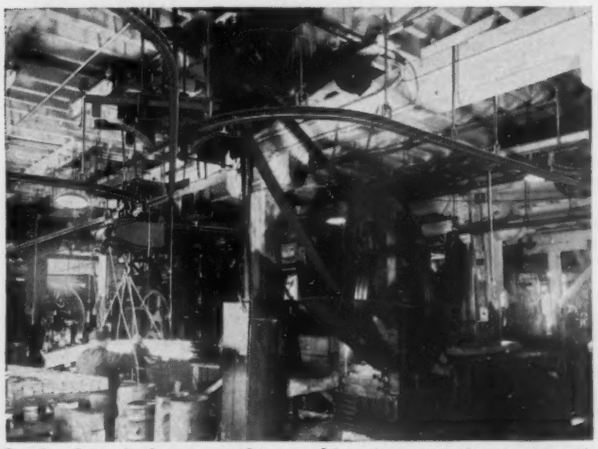
HOW'S THIS FOR *Stepping Up* PRODUCTION?

YOU, too, can accelerate your rate of production as rapidly as you release man-power from handling labor. Any mechanical means of lifting and carrying even light loads reduces fatigue and thereby makes possible a greater output per man.

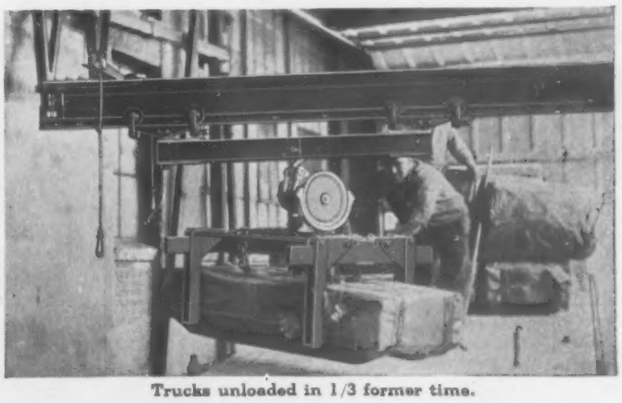
This is only one of many advantages gained with American MonoRail Handling Systems . . . to mention a few others — reduction in idle machine time, more compact arrangement of machinery and equipment, congested operating conditions overcome, and waste space converted into profitable space. BUT STEP UP PRODUCTION YOU MUST. Let an American MonoRail engineer show you how it can be done in your plant. American MonoRail equipment is engineered to meet the particular requirements of each problem. There is no delay or shut down during installation.



Special crane handles multiple units through cleaning process.



Overhead tracks bring metal to machines in compact arrangement



Trucks unloaded in 1/3 former time.

THE AMERICAN MONORAIL CO.
13102 ATHENS AVENUE CLEVELAND, OHIO

over of many mills to production of steel plates.

It is estimated the industry used about 150,000 tons of steel sheet and smaller quantities of zinc last year. The Buildings Materials Branch has under consideration an order which would reduce substantially the production of metal bases in plaster or stucco construction, and accessories of such bases.

Subcontracting Experiment To Be Conducted in Chicago

Directory of war work to be subcontracted will be tried on a limited scale in the Chicago area soon, according to William H. Harrison, WPB production director.

In the test, selected prime contractors will list the work they have to be done, by separate parts, classifying each by the machine needed to make it, the tolerances required and the hours per week these machines have to work.

This information will be coded and arranged alphabetically so that prospective subcontractors can readily find the jobs that will fit their idle machines.

"During the period of development," Mr. Harrison said, "the plan was given a preliminary test in Indianapolis. We now propose to make a further test on a selected basis in the Chicago area. In order to obtain a closer study of the plan's operation, the number of prime contractors to participate will be limited.

"Lists prepared by the prime contractors will be distributed to a group of potential subcontractors who will have the opportunity to pick out and consider the jobs they are equipped to handle. This places them in a position to deal directly with the prime contractors.

"Further plans making somewhat different approaches to the same problem will be tested in other areas."

Consumption of Palm Oil Ordered Restricted by WPB

To conserve palm oil, which is generally imported from overseas, the consumption of palm oil after April 1 has been limited to certain specified uses by General Preference Order M-59.

On and after April 1, the only permitted uses of palm oil will be as follows, unless other uses are specifically authorized by WPB.

1. The manufacture of tin plate, terne plate, long terne plate, steel sheets, steel strip and black plate.
2. Any manufacturing process in which glycerine is produced where the amount of glycerine remaining in the product does not exceed 1.5 per cent.

Metal Household Furniture Output Restricted To Conserve Materials

WPB has banned production after May 31 of metal household furniture, covering a wide variety ranging from tables and chairs to mirror frames and shoe racks, and has put into effect drastic limitations on the manufacture of such products for the interim period.

Production to be permitted from the effective date of the order, March 20, until May 31 is based on a percentage of iron and steel used during a base period (July 1, 1940-June 30, 1941), varying for each month and according to the size of the manufacturer.

Additional drastic provision of the order prohibits the use in any way of metals other than iron and steel in the production of household furniture. Such metals in inventory on the effective date of the order (L-62) are frozen, subject to future disposition by WPB.

Manufacturers needing additional iron and steel may acquire the metals only from inventories of other manufacturers. Reports on all iron and steel not used in the manufacture of furniture pursuant to the limitation order, or sold to other manufacturers, and a report on the frozen stocks of other metals will be required some time in June.

After the report forms are prepared, completed and collated by the WPB, steps will be taken to liquidate the frozen inventories.

The order defines metal household furniture as any product containing more than 5 per cent of metal in the net weight of the finished product (other than nails or other joining hardware).

This definition includes porch and garden furniture, ornamental wall brackets, benches, beach and lawn umbrellas, chaise longues, couch hammocks, tables, chairs, tea wagons, buffets, dressers, chiffoniers, chifferobes, vanities, wardrobes, chests, kitchen cabinets and cupboards, undersink cabinets, broom cabinets, utility cabinets, venetian blinds, stools, shoe racks, medicine cabinets, smoking stands and ash trays.

In addition, products such as radiator covers, porcelain table tops, settees, davenports, table desks, chiffodesks, knee-hole desks, flexible steel mats, metal picture frames and mirror frames, coat and hat racks, under-lavatory closets, clothes hampers, drapery attachments, flower vases and broom racks are included.

Furniture such as cots, beds, studio couches, sofa beds, bunks, berths, mattresses and bed springs is not covered by terms of L-62.

Steps which will be taken to convert the metal household furniture industry to direct war production will be discussed with manufacturers in the next few weeks.

Sharp curtailments in the amount of iron and steel used to manufacture beds, bed springs, and mattresses are imposed by Order L-49. Restrictions will be effective for a period of three months beginning April 1.

Under terms of the order, manufacturers are instructed to limit the use of iron and steel to a specified percentage of the use of these materials during the 12 months' period ended June 30.

Percentages of curtailment vary according to the nature of the product and the size of the manufacturer. Class A manufacturers, those who used 500 tons or more of steel in the base period, are required to curtail steel use from 35 to 60 per cent, depending on the product.

Class B manufacturers, those using between 100 and 500 tons of steel in the base period, are required to curtail use of steel 25 to 50 per cent. Those manufacturers who used less than 100 tons of steel in the base period—Class C—are required to reduce their use of steel 15 to 40 per cent.

Gray Iron Founders To Discuss Price Ceiling

Gray iron foundrymen will attend a series of meetings to be held in 19 foundry centers to discuss the position of the industry regarding the proposed freezing of gray iron castings prices.

Short statements of the situation in each district regarding costs, wage rates, wage increases, prices, and competition prevailing will be prepared. Each of the 19 meetings will elect a chairman, and these chairmen will subsequently hold a meeting at which the various aspects of the problem can be discussed and a committee of six men named to work with OPA and present the industry's views on prices.

Organization of the meetings is being undertaken by the Gray Iron Founders' Society, and invitations are being sent to all gray iron foundries in the country, indicating where the nearest meeting is being held.

Priorities System To Be Revised To Permit More Complete Allocations

WASHINGTON

FUNDAMENTAL changes in the priorities system to enable the WPB to go as far toward complete allocation of materials as war needs may require are being worked out by the Divison of Industry Operations.

A specific requirements approach to the control and distribution of scarce materials will replace the use of general or blanket priority rating orders as rapidly as the necessary new order and procedures can be put into effect. Between pril 1 and June 30, most of the blanket rating orders will be revoked or allowed to expire, and companies which have been operating under blanket ratings will be required to apply for priority assistance under the Production Requirements Plan.

The rapidly increasing materials requirements of the war program make it impractical to continue the use of preference ratings which have been assigned under existing "P" orders to whole industries, without any exact check of the amount of material which such ratings may be used to obtain. Through the PRP, the director of Industry Operations will continue to assign ratings to deliveries of materials for essential uses, but the rating assigned in each case may be used to obtain only a specified quantity of materials or products.

Under the PRP, a company makes a single application for priority assistance covering all of its estimated materials needs over a three-month period. The applicant must submit full information as to his inventories and the end use of his products. Priority ratings are assigned on the basis of such applications to permit producers of products essential to the war effort or minimum civilian needs to obtain specified quantities of materials during a quarter. Interim applications may be filed when a company needs additional quantities of material during the quarter because of increased war or other essential business.

Modified Plan Available

A modified PRP has been developed to meet the needs of small firms whose business is less than $100,000 a year. Such companies may use a simplified application form, PD-25X.

The effect of placing virtually all of American industry, including producers who supply the Army and Navy, under the PRP will be to give the WPB closer control of the distribution and use of all scarce materials. The most important raw materials, such as aluminum, copper and steel plates, are already allocated at the producer's level. General use of the PRP will provide control of the flow of these materials down to the level of end products.

Because it would be physically impossible to handle the load of PRP applications if they were to be submitted immediately from all companies in all industries, the change-over from the use of blanket ratings will be continuous over a period of three months, and each industry will be notified as to the date by which the change must be completed. A considerable number of "P" orders have already been amended to provide that after a specified date, the blanket ratings assigned by such orders will be revoked, and producers who have been using them will have to apply for priority assistance under PRP.

Processing of PRP applications will be handled in co-operation with the appropriate industry and materials branches of the WPB in such a way that all companies producing similar products for similar uses will receive uniform treatment.

New limitation or conservation orders will continue to be issued to curtail production by nonessential and less essential industries which still use scarce materials, and to force substitutions for scarce materials wherever possible in essential industries. All ratings assigned under PRP will be subject to such controls.

Use of the new procedure, in combination with limitation orders and the materials orders already in effect, will permit administration of the PRP to expedite direction of resources into the most effective channels for promotion of the war effort.

PRP is not a new and untried pro-

"Industry" Theme of First Wartime Art Exhibit

Described as the "first graphic summary of the biggest job in all U. S. history, America's fight to win the war", a group of pictures was moved last week from the National Gallery of Art in Washington on a nation-wide tour.

Accompanying photographs of the pictures (of which one is reproduced herewith) an official announcement from OEM stated: "Sponsored by the Office for Emergency Management and the Fine Arts Section of the Procurement Division of the Treasury Department, this exhibit proves that participation in the victory drive is not limited to one group or class but is enjoyed by Americans of all racial, regional, economic and religious groups and the paintings on view are consequently representative of democratic American art at its best."

In a competition opened immediately after Pearl Harbor and closed Jan. 15, entries numbered 282,5 from 1189 artists. More than 100 were purchased and exhibited at the National Gallery of Art. The jury selected 450 other paintings, prints and drawings, from which smaller traveling exhibits were formed.

The picture above is that of a water color by Elizabeth Olds, New York, depicting workmen rolling up sheets of aluminum—"vital in the war effort".

gram. The plan was announced early in December and a considerable number of companies have been operating under it since Jan. 1. PRP itself grew out of the old Defense Supplies Rating Plan, which was first announced nearly a year ago.

The extension of PRP to cover a much broader field, and its substitution for "P" orders, will constitute another long step toward gearing the whole American economy into the war program. When the changeover is completed, priority assistance will be granted only for specified quantities of materials or products, and the WPB will then be in a position to go as far toward complete allocation as war needs may require.

The statistical information obtained as more and more companies operate under PRP will enable the division of Industry Operations, in co-operation with the WPB Requirements Committee, to steadily improve the assignment of ratings and allocation of materials for various industries. In the meantime, a mechanism for controlling the distribution and use of all scarce material will have to be set up.

The industry branches in the Bureau of Industry Branches and the priorities staff of the Bureau of Priorities have been ordered by the director of Industry Operations to put the new policy into effect as rapidly as possible. Specific announcements will be made in each case as additional industries are affected by the program.

Recommendations for Steel Plate Specifications Issued by WPB

CONSUMERS of steel plates have been asked by the WPB Iron and Steel Branch to conform to a list of requirements in placing orders so that all plates possible may come from continuous strip mills.

Requirements are:

Universal or strip mill edge should be acceptable for all plates that can be rolled within the limits of strip mills.

Plates should be 72 inches and narrower wherever practical on account of the larger number of units available in the industry, (6 strip mills can produce plates up to 72 inches wide, 1 up to 84 inches and 3 up to 90 inches).

Gages should be held to a minimum number. If possible, from $\frac{3}{16}$ to ¾-inch use only increments of 1/32-inch; and from ¾ to 1½-inch increments of 1/16-inch. Most strip mills can produce plates up to ¾-inch thick; some can produce thicker plates and some are confined to thinner gages.

To the fullest extent possible, lengths should be held to 30 feet and under, on account of the number of mills whose maximum length is 30 feet to 30 feet 6 inches. Multiples of short lengths are desirable, but not to exceed 30 feet 6 inches.

A minimum of 10 tons per item for any width, gage and length is required in order to obtain maximum strip mill production.

The marking requirements should be kept to a minimum that will properly identify the item.

Orders should be placed as far in advance as possible, giving full specifications and order of sequence. This should be not less than 30 days in advance of the first day of the month in which shipment is desired and preferably earlier.

In designing new boats, particular attention should be given to the above requirements.

Any orders for stock material should be kept to a minimum number of widths and lengths.

New Priority Form To Simplify Distributors', Wholesalers' Problems

PRIORITY problems of distributors, wholesalers and jobbers will be simplified by the use of a new application form which has been designed for their special use. The new form, to be known as PD-1X, will be available soon after the first of April.

Insofar as materials and supplies can be made available without interfering with the war effort, priority assistance will be given to distributors, wholesalers, and jobbers who apply on the new form so that they can keep sufficient stocks on hand to maintain essential productive and service industries in operation.

In recent months, distributors have been hesitant to make deliveries to retailers, restaurants, and other important users who cannot furnish priority rating certificates, because the distributors were afraid they would not be able to replace the material in their own inventories. Use of the new form will enable distributors to request preference ratings for essential supplies without receiving or extending a rating on every individual order they fill.

Distributors, wholesalers and jobbers who purchase supplies of the following descriptions from producers will be entitled to apply for preference ratings on Form PD-1X:

Automotive, aviation, builders, construction, electrical, foundry, hardware, health, industrial, plumbing and heating, railroad, refrigeration, restaurant, transmission, textile mill, welding and cutting.

Distributors who use Form PD-1X will be required to furnish information on their sales and inventory of the types of material for which priority assistance is requested. Ratings will be assigned on the basis of importance of product, use to be made of it by distributors' customers, and availability of materials.

Distributors should also furnish information showing the percentage of material shipped out of stock on rated orders during the preceding month or second preceding month, as compared with total sales, if such information is available. The distributor should also give any pertinent information as to where he sells the products he distributes, such as: To retail stores serving farms; to workers using tools in defense plants, etc. Where need is based on seasonal demands, the distributor should show his seasonal purchases in 1941.

A uniform system for assignment of ratings will be developed in co-operation with the various industry and materials branches concerned so that all distributors handling the same types of products for the same classes of customers will receive similar ratings.

After the new forms become available, distributors, wholesalers, and jobbers will be required to use them exclusively in applying for priority assistance. When a rating or ratings are authorized in connection with a PD-1X application, they may be applied on distributors' orders to producers by a simple form of endorsement on the purchase order containing the serial number of the approved application.

Steel castings production in January totaled 134,778 net tons, 115.2 per cent of capacity and bookings were 150,551 tons, 128.6 per cent of capacity. These figures compare with 131,518 tons and 113,034 tons, respectively, in December. In January, 1941, output totaled 94,409 tons and orders 110,579 tons.

RFC Commitments for War, Defense Activities Total $11,494,438,962

WASHINGTON

LOANS and commitments by the Reconstruction Finance Corp. and its subsidiaries in connection with the war aggregated $11,494,438,962 as of March 7, according to a report submitted last week by Jesse H. Jones, federal loan administrator.

A breakdown of the commitments follows:

Defense Plant Corp.	$4,797,757,903
Defense Supplies Corp.	1,749,521,213
Metals Reserve Co.	2,215,818,000
Rubber Reserve Co.	875,000,000
War Insurance Corp.	100,000,000
RFC loans direct	1,259,865,964
Export-Import Bank	496,475,882

Defense Plant Corp. has financed and contracted to finance the construction or expansion of more than 700 plants for the production of ships, planes, tanks, guns, ordnance, magnesium, aluminum, steel, synthetic rubber, 100-octane aviation gasoline, and other materials at an aggregate cost of $4,797,757,903.

The WPB recommends the agency contract with a particular manufacturer for the construction and operation of a particular plant at a particular location. DPC then works out terms and conditions of the contracts and arranges the financing.

Plants and equipment are owned by DPC and operated by manufacturers under lease or other agreements. Defense Plant Corporation is protected either by a rental charge received from the lessee or by a contract of reimbursement entered into with the Army or Navy Department or other defense agencies of the government.

Financed Metals Expansions

In the aluminum expansion DPC and the RFC have made commitments aggregating $423,000,000 for the construction of plants which will increase annual capacity by more than 1,313,500,000 pounds of aluminum, 2,220,000,000 pounds of alumina, 360,000,000 pounds of aluminum sheet, and 194,200,000 pounds of aluminum alloy and extruded products. Metals Reserve Co. and the RFC have contracted to buy 1,000,000,000 pounds of aluminum from the Aluminum Co. of Canada for delivery in 1942, 1943 and 1944.

In the magnesium development and expansion program DPC and the RFC have made commitments aggregating $360,000,000 for the construction of magnesium plants with annual capacity of 627,500,000 pounds.

In the steel program DPC and the RFC have made commitments for $694,000,000 to increase the annual iron and steel production by 6,200,000 tons of steel ingots, 5,500,000 tons of iron ore, 10,030,000 tons of pig iron, 1,950,000 tons of steel plate, 1,879,000 tons of armor plate and forgings, and 1,180,000 tons of blooms, bars, castings, and tubing; and also provided for increased capacity of coke, coal mining, and annealing and heat treating of steel.

A tin smelter to smelt Bolivian tin ore, which will start operations next month, is being built by DPC at a cost of approximately $5,000,000. It will have an annual capacity of 30,000 tons of fine tin from Bolivian ore and 21,600 tons of fine tin from alluvial tin ores. The plant will be readily capable of expansion to 50,000 tons annually from Bolivian tin ore. Tin concentrates have already been imported for more than a year's operation.

DPC commitments include over $1,085,400,000 for plants and equipment for the production of aircraft and parts; $1,196,000,000 for the manufacture or purchase of machine tools; $377,000,000 for the production of ordnance; $171,000,000 for the construction and equipment of shipyards and vessels; $45,000,000 for the manufacture of radio and scientific equipment, and numerous other items.

Commitments by the Metals Reserve Co. total $2,215,818,000. Accompanying tabulation shows these expenditures by materials.

Defense Supplies Corp., at the President's request, has contracted to purchase manganese, chromium, asbestos, platinum, santonin and other strategic and critical materials from the Amtorg Trading Corp., owned by Russian interests.

The contract contemplates purchases will amount to about $100,000,000, and provides for advance payments not to exceed $50,000,000 to Amtorg against such purchases. To date, $48,665,916 has been advanced under the contract.

Expect Heavy Losses

The DSC schedule includes a commitment to undertake, in accordance with the request of the WPB, a program of converting to war purposes certain types of scarce materials. This includes the acquisition of partially fabricated materials, scrap and obsolete materials and other inactive inventories of aluminum, copper, brass, iron, steel, tin, ferro-alloys and other critical materials and their reduction to a usable state for war purposes. It is estimated that the total cost of this program may run as high as $720,000,000 and that there probably will be a loss of at least one-half of this amount in making the materials available to the trade at current ceiling prices.

Congress on Sept. 26, 1940, increased the lending authority of the Export-Import Bank from $200,000,000 to $700,000,000, allowing a revolving fund up to $500,000,000 "to assist in the development of the resources, the stabilization of the economies, and the orderly marketing of the products of the countries of the Westetrn Hemisphere."

Out of this $500,000,000 loan authorizations of $496,000,000 for Latin America have been made. Total loans and outstanding commitments of the bank as of March 14, aggregate $767,000,000, including two commitments approved in principle.

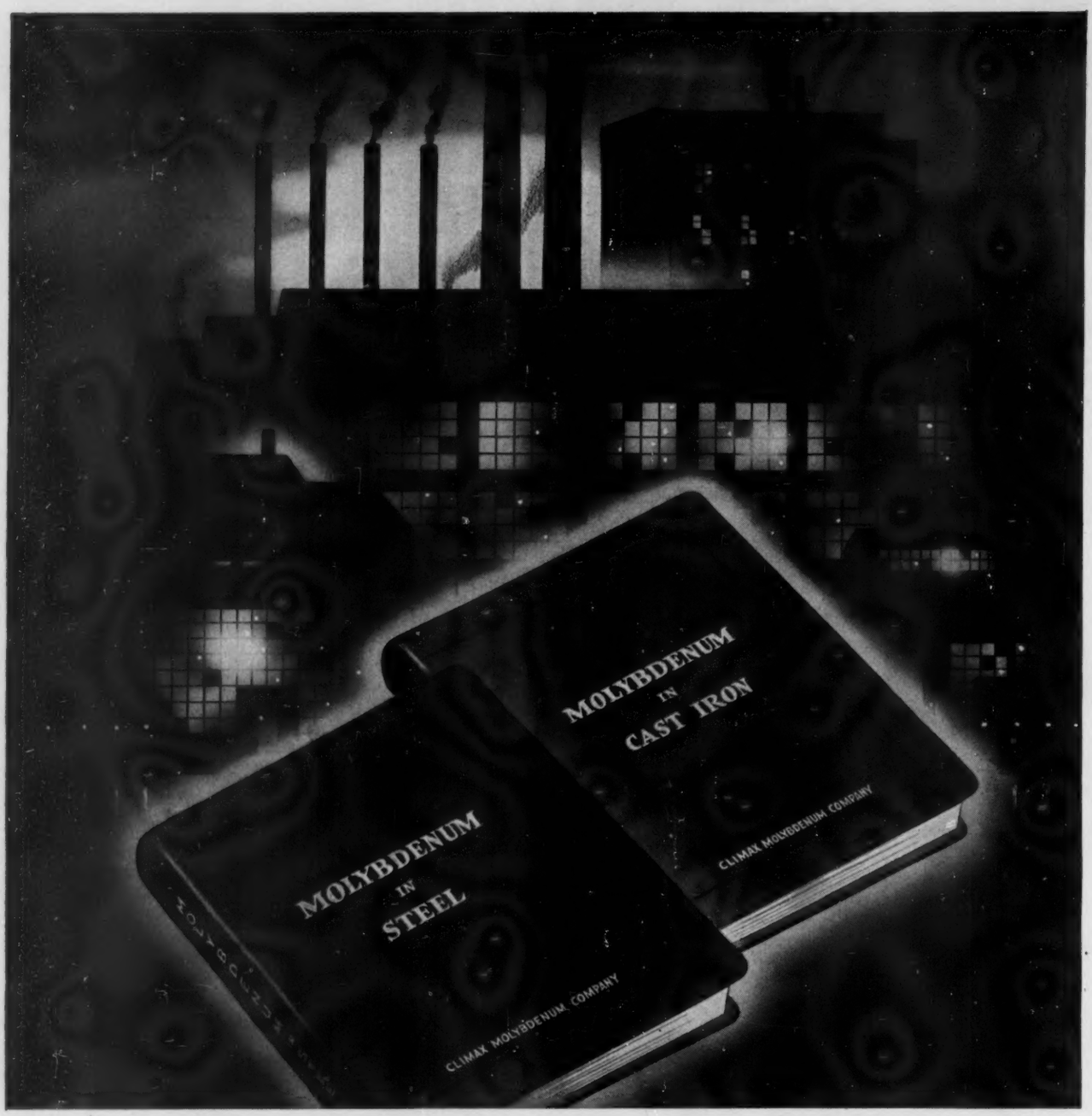
Directors of the Export-Import Bank include representatives of the State, Treasury, Agriculture and Commerce Departments, and the RFC. No loan is considered without first clearing it with the State Department.

Direct loans by RFC aggregate $664,006,979 to 480 borrowers engaged in war production. This includes 675 separate loans of which 620 were for less than $1,000,000 each.

Materials Purchased by Defense Supplies Corp.

Material	Amount
Aluminum	$ 245,089,000
Antimony	7,053,000
Asbestos	215,000
Bauxite	8,741,000
Beryllium	882,000
Cadmium	194,000
Chrome	31,808,000
Cobalt	60,000
Copper	226,402,000
Diamonds	3,469,000
Graphite	486,000
Iridium	128,000
Iron ore	21,896,000
Lead	117,881,000
Lead ore	6,043,000
Manganese	132,858,000
Mercury	3,277,000
Mica	6,340,000
Molybdenite ore	332,000
Nickel	4,469,000
Crude platinum (iridium, osmium, palladium, rhodium and ruthenium)	1,292,000
Quartz crystals	3,814,000
Rutile ore	119,000
Speiss	559,000
Tin—refined	207,556,000
Tin ore	129,922,900
Tungsten	154,035,000
Zinc	146,570,000
Zinc ore	9,808,000
Brazilian materials	121,000
Chilean materials	12,325,900
Chrome plant commitments	5,724,000
Philippine materials	5,250,000
Nicaro Nickel Co. (stock)	1,100,000
Domestic scrap materials	720,000,000
	*$2,215,818,000

*Includes commitments totaling $38,143,000 which were canceled, principally due to inability of sellers to deliver.



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MOLY

Mirrors of *MOTORDOM*

War production may result in drastic changes in auto designs when assemblies are resumed . . . Studebaker engineers perfect silver plating for bright trim, pigeon-hole method for duration . . . Production drives already in effect in two motor plants, as Nelson plan is formally presented. Believe words and committees no substitute for hard work . . . To hold debate on Reuther plan this week

By A. H. ALLEN
Detroit Editor, STEEL

DETROIT

THOUGH it may be years away, the next new model automobile may be a far different vehicle from its 1942 counterpart, contrary to opinions which have been expressed to the effect that when cars are built again they will resume just where they left off Feb. 10. War production naturally is the only concern just now, but in off moments executives will do a little speculating about the automobile of the future; and they are recognizing the possibility of some radical changes.

For one thing, the tools and dies for 1942 models have been stacked up in storage yards, and the salvage people are eyeing them avidly. With only a little preparation, they would make fine fodder for melting furnaces now sorely pressed for metal. True, the financial write-off involved in scrapping these tools which were used only about six months will be large, but already some provisions have been made on this score. Even should the 1942 tools be saved for some future year, it would take at least six months to get them back into the plants and lined up again with other equipment for automobile production.

Drastic Changes Foreseen

Granted that resumption of 1942 model production could be effected, there remains the steadily increasing danger that some smart producer will reap the benefit of knowledge he is now gaining in aircraft production, for instance, and come up with a new automobile design which would obsolete all present versions. So, it is beginning to look like the 1942 model is definitely a dodo and when automobiles are once more rolling down the assembly lines they will feature widespread use of aluminum, magnesium, transparent plastics and other offshoots of airplane construction ideas. Certainly the tremendous capacity for light metal production eventually will bring the price of these metals down to where they are competing in no uncertain fashion with cold-rolled strip steel.

Advances will come not only in materials for automobiles but in all their component parts as well—engines, transmissions, bearings, hardware, wheels and the like. Lessons are being learned today that will pay dividends tomorrow in better, more efficient and less costly transportation. That is one thing war production can do for the future of industry, to ease the catastrophe that is war.

Adopt Silver Plating

An example of one new idea, stimulated to practical use by materials shortages and just on the assembly line when auto production was stopped was the adoption of silver plating on interior and exterior hardware by Studebaker. Developed by Studebaker engineers, with the assistance of a silversmith company and a manufacturer of band instruments, the process was set up on a production basis without any unusual difficulty. Steel parts are given a special type of bonderized coating and silver electroplated directly on this coating without requiring any copper or nickel base coats. Silver is plated on in two strike baths with special current densities. On exterior parts such as hood ornaments, door handles and headlight rims further protection is afforded by indium plating the silver after it has been given a Butler finish. Indium then is alloyed with the silver by baking in a still atmosphere for two hours at 350 degrees Fahr. The indium-silver coating then is Butler finished with 250 Lea compound, using a slow-speed soft wheel. Final finish is two coats of clear synthetic enamel, each coat baked one hour at 270 degrees.

Bright trim produced by this process "gives a richness and beauty that excels chromium plating in many respects," according to the Studebaker sales manager. Currently, both silver and gold plating are being used on a number of consumer products which formerly carried chromium plate.

Donald M. Nelson's Production Drive was formally introduced to Detroit last Tuesday before about 250 labor union representatives and 225 from company managements. Resolution offering wholehearted support to the drive was read and passed by acclamation, C. E. Wilson, president of General Motors, being asked to present the resolution. In an impromptu discussion, Mr. Wilson echoed the sentiments of many other executives that the production battle cannot be won with words and committees, that the only solution is "hard—even overly hard—work."

War Output Accelerated

Two production-stimulating campaigns already in effect, one at Packard and one at Oldsmobile, were explained by representatives of these companies. The Olds plan, keyed to the phrase, "Keep 'em Firing," was instituted Dec. 25, 1941, at Olds cannon and shell plants, and goes considerably beyond the scope of the Nelson plan. It includes such devices as production scoreboards in plants, four-color posters changed every three weeks, a monthly publication mailed to 8800 homes of workmen, 24-sheet posters on billboards around Lansing, Mich., local and national newspaper advertisements, a radio program, window cards in stores and homes, stickers for letterheads and car windshields, lapel buttons for workmen, slogan contest with defense bonds as prizes, a sound system for the plant to present regular broadcasts and a

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motion picture of plant operations.

Directed by Olds advertising and public relations experts, the plan is considered to be highly effective (and obviously highly expensive). Details of its workings are being taken by personal representatives from Olds to the plants of 154 subcontractors furnishing materials and parts for Olds.

The Packard plan, outlined by George T. Christopher, general manufacturing manager, has been expanded around the slogan, "Work to Win," and has three basic principles—inspiration, information and education. All the usual devices for spreading information among employes are used; awards are made for special effort on the part of employes and departments, displays of plant progress are set up, and a school for training new workmen is a part of the overall plan which is circulated among the 18,000 employes of the Packard Rolls-Royce engine plant.

About Face Likely

As noted here two weeks ago, an incentive system is an integral part of any of these production plans, and automobile plant managers have always been strong believers in incentive systems, albeit in earlier years some incentive systems got a black eye because of unfair and nonrigid standards of work. The unions, however, succeeded in throwing out all incentive systems in the motor industry, and now are faced with the prospect of taking them back in the interests of the production drive. An about-face seems imminent, therefore, on the part of the UAW-CIO.

Just last week a girl operator in an arms plant here was suspended by the union for "conduct unbecoming a union member." Although there were other angles, one phase of her misconduct appeared to be a tendency to work too fast.

Slowdown Becoming Unpopular

It is a safe bet that, unions notwithstanding, the slowdown type of workman is going to be an increasingly unpopular individual as time goes on. The reason is simply that more and more brothers, husbands, fathers and sweethearts are being inducted into the Army, and "those they leave behind" who are working in war industries are giving everything they have to get out production so that their boys in the services may have the weapons with which to fight.

There are even cases reported in plants around Detroit where one workman is holding jobs in two different plants. He uses an assumed name in the second plant, of course, works a later shift than in the first plant. In such cases, however, it is likely that greed exceeds patriotism as the explanation.

In answer to UAW demands for contract changes, General Motors Corp. has drawn up a few of its own demands and transmitted them to the union. They include: Discontinuance of attacks on management's efforts to increase production; elimination of requirements for double-time pay under any circumstances; recognition of management's right to establish any system of shifts deemed necessary to speed war production; withdrawal by the union of opposition to individual piecework or other incentive method of pay; agreement to provision of differentials in wage rates in certain job classifications, so that individual employes who produce more and better work may be rewarded; promotions to better jobs on the basis of merit, ability and performance; reduction by 50 per cent in number of union committeemen handling complaints in plants; elimination of lost time resulting from different committeemen investigating identical complaints; elimination of provision requiring unnecessary employment of committeemen when only a few men are working.

Will Debate "Reuther Plan"

Negotiations on a new contract began last week and although the UAW-CIO objected to the proposal to open hearings to the press, it was understood some representatives of the press contemplated attending the meetings anyway.

This week will see an open debate on the overplugged Reuther plan, between its proponent, Walter P. Reuther of the UAW-CIO and C. E. Wilson, GM president. While the Reuther plan of building 500 airplanes a day with facilities existent in the auto industry in December, 1940, is a dead issue, the debate may serve to inform Mr. Reuther and his adherents why his plan was unsound and impractical.

All manufacturers of motor trucks, buses and trailers joined last week in organization of a military vehicle devision of the Automotive War Council for War Production, headed by I. B. Babcock, president of Yellow Truck & Coach. A governing board of ten representatives from the truck, bus and trailer industries was set up to attack jointly problems of production, engineering, parts output and distribution, as well as to work out interchange of techical information and facilities.

Chevrolet and Buick salesrooms in the General Motors building here were "converted" last week into an Arms for Victory exhibit sponsored by General Motors. Open daily from 10 to 10, the exhibit of guns, airplane parts, engines, shells, cartridge cases and the like, all produced in GM plants, was drawing large crowds. Samples on display were not usable items, being either rejects, outdated pieces or test samples.

Pontiac Produces Guns for Merchant Fleet

BOFORS barrels for the Swedish-designed antiaircraft guns are being turned out in quantity at the Pontiac plant of General Motors Corp. at Pontiac, Mich. They are intended for arming United States merchant ships. NEA photo

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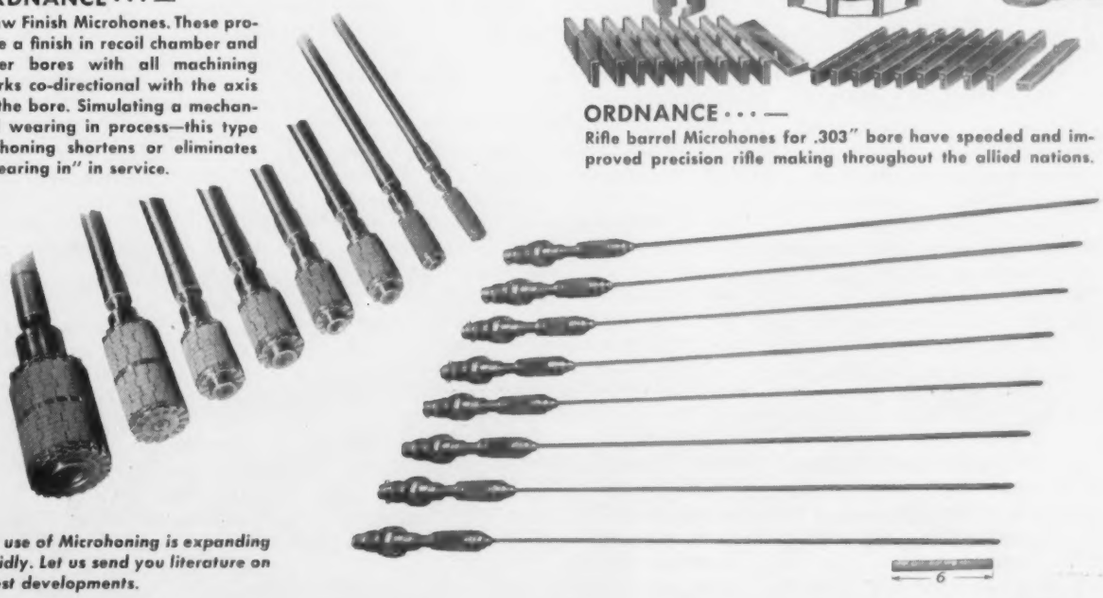

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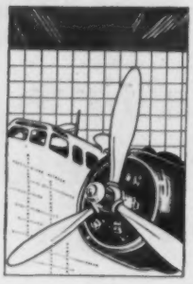

In-line engines free hands of airplane designers and add to speed because of reduced drag, but they have their critics . . . Visionaries claim aviation still in its infancy, but their dreams must wait end of military effort . . . New plants for bombers . . . Freeze designs and assign production to different plants . . . Steel and wood replace aluminum in trainers, releasing 1250 pounds of light metal per plane

WHETHER or not, as W. B. Stout in Detroit maintains, the liquid-cooled in-line aircraft engine is "an automobile man's idea of what an airplane engine ought to be" the fact remains that this type of engine unshackles the hands of the airplane designer. He can spot his engines at the rear for pusher-type planes. He can put them in the wings; or he can put them in the fuselage and connect them to outboard driveshafts. In other words, he does not have to start his design with engines in front where they can meet the cooling air stream.

Furthermore—and this is the point proponents of the liquid-cooled engines stress—the reduced frontal area of the in-line engine lowers the drag and thereby increases speed for the same horsepower. They cite the following tabulation of speed, drag and horsepower required to move one square foot of frontal area through the atmosphere:

Speed, m.p.h.	Drag, pounds	Horsepower
100	30	8
200	120	64
300	270	216
400	480	512
500	750	1000

Nevertheless, the outspoken Mr. Stout tosses aside the liquid-cooled engine as too heavy, too vulnerable and too short-lived between overhauls. He says the radial engine has average life of 1000 hours, against 100 hours for the in-line engine. Then he goes into the matter of crankshaft weight compared to the torque transmitted, and draws in the analogy of the automobile engine which, by virtue of the gear reductions and axle sizes ought to have a crankshaft about ⅜ of an inch in diameter, but instead uses a heavy crankshaft with 2-inch pins simply because of the deficiencies of the steel forging from which it is machined.

At this point the forging people are ready to fight, but the smiling Mr. Stout waves them aside and proceeds with the story of the engine he is now working on, which is aimed at the goal of 100 horsepower rating, using 100-octane fuel, weighing 100 pounds, selling for $100 and built at a rate of 100 a day. Fanciful? Perhaps, but what revolutionary new idea did not appear "screwball" in its early stages?

It sounds fanciful to hear Igor Sikorsky tell about his helicopter (not autogiro), powered by a 65-horsepower engine, in which he can pick apples off a tree in a 30-mile wind. Ridiculous? Sikorsky has pictures to prove it.

Dreamers Look Ahead

Essentially, in the minds of people like Sikorsky, Stout and a good many others, aviation is still in its early stages, despite the millions of square feet of manufacturing floor space and the hundreds of thousands of workmen now devoted to turning out military planes in mass quantities. The dreamers look ahead and see ocean-spanning planes the size of modern steamships, and small private planes which are not only fool-resistant but foolproof as well. They see all first class intercity mail going by air, as well as tons of long-distance freight.

They see airports, paralleling modern express highways, with filling stations serving automobiles on one side and airplanes on the other side. They see helicopters descending to a few feet off the ground from such service stations, attendants rushing out and taking off a landing wheel for repairs while the plane remains hung in midair, replacing the wheel and the driver sailing off again. They see the oceans dotted with floating airdromes, complete with hotel and recreational facilities for passengers.

Attractive as these prospects seem, it is difficult to give them even a second thought while the aviation industry is faced with the hard realities of war, and a war which we are losing because of our deficiencies in fighting planes and bombers. Discussions of radial versus in-line engines become largely academic; the job at the moment is to boost production of what we have.

The automobile companies naturally are partial to in-line liquid-cooled engines. They are their babies, and the partisanship is pardonable. Nevertheless, all three of the large auto companies are building or preparing to build radial engines of current design, and two other independent companies are doing likewise. One large motor company will build 800 such double-row engines this month alone; another company is nine months ahead of schedule on its radial engine program. All are confident of breaking every earlier prediction concerning output, if they can be assured of only one thing—enough materials.

Lycoming Enters Field

Latest of what appears to be a new aircraft-engine building project is at Toledo, O., where Lycoming Division of the Aviation Corp., has been granted a $7,200,000 Defense Plant Corp. loan for a new plant. Lycoming has about 20 approved types of engine design, all of the air-cooled variety, some radial and some horizontal-opposed, most of them in the smaller horsepower range compared with air-cooled engines now in mass production.

Activity of automotive and auto body plants on the supply of airframe parts for bombers is gaining headway, although the pains of easing some of this stuff into the production stage have been excruciating. Murray Corp. in Detroit now has two plants busy on airframe parts, including wing sections for Douglas bombers, inner wings and nacelles for Boeing Flying Fortresses, control surfaces for Curtiss combat planes, parts for the Ford-Consolidated bomber, and gun turrets of the General Electric design

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for bomber installation.

Frequent design changes have been slowing up Chrysler work on parts for the Martin B-26 bomber. Fisher Body Division of General Motors is ahead of assembly plants on the North American B-25 bomber. The most cheering progress is at the Ford Willow Run plant where some of the projected operations in production of the Consolidated B-24 bomber simply stagger the imagination. To the men working on the Ford bomber job, the recent statement attributed to Tom Girdler about the perfection of moving assembly lines at the Consolidated plant on the Coast no doubt provoked a chuckle. Ford methods will go far beyond anything yet conceived on the coast, although naturally the design of the bombers built in Detroit will be virtually identical with those made in California.

Two new plants to build the Boeing Flying Fortress, one in the South to be operated by Bell Aircraft and one in Ohio to be operated by General Motors, will make this hefty high-level bomber one of the most widespread jobs in the industry.

This is a trend which is being accelerated in aircraft production—spreading the best and newest of approved designs of fighters and bombers over various different producers' plants. The idea probably started with the Boeing-Vega-Douglas plan to co-operate on the Flying Fortress design of Boeing's, but similar techniques are being applied to other designs. It is reported that K. T. Keller of Chrysler Corp. figured prominently in this newest plan to step up production.

P-47 Rights Released

One such design is the P-47 fighter of Republic Aviation Corp. In a recent statement to stockholders, W. W. Kellett, chairman of the board of the company, stated that Republic had released its design rights on this heavily-armed high-altitude pursuit ship and was gladly co-operating with other producers at the request of the WPB. The P-47 is highly supercharged and powered by a 2000-horsepower double-row radial engine.

An example of how the current upswing in aircraft production has affected parts suppliers was given in a recent statement by E. R. Breech, who at the age of 45 was named new president of Bendix Aviation Corp. Sales of the company mounted from about $42,000,000 in 1939 to better than $156,000,000 last year, and present plans call for about $500,000,000 this year, and a billion dollars in 1943, or about a 25-fold expansion in five years. Since 1939, employment in the 20 Bendix plants has risen from 10,000 to 40,000, and 300 new subcontractors have been established. By 1943 it is expected that employment will reach 70,000.

Of more than ordinary significance in these days of short aluminum supplies was the announcement by North American Aviation Inc., Inglewood, Calif., last week that combat training ships built there already are using plywood in certain parts to replace aluminum and shortly will make extensive use of low-alloy high-tensile steel in place of aluminum alloy. An advance combat trainer—standard advanced trainer for the army, navy and the British R.A.F.—has been redesigned to use steel and plywood in place of 75 per cent (by weight) of the aluminum alloy parts hitherto used. Wood substitutions account for 250 pounds of saving, and steel 1000 pounds, making 1250 pounds of aluminum saved per ship.

Among parts which structural tests have indicated can be switched to steel are wings, wing center sections, wing tips, vertical stabilizers, rudders, elevators, flaps and ailerons.

Appearance Little Changed

Except for a smoother surface on wings and fuselage, the new planes will look much the same as their all-aluminum predecessors. Smoother surfaces will result from elimination of rivets, since wood assemblies will be made with glue and steel parts spot welded. Costs are expected to be lowered appreciably, too, after absorption of initial tooling expense.

Only apparent disadvantage of the redesign is the 3 per cent increase in weight, or 150 pounds on the AT-6A advanced trainer, but engineers are confident that further improvements in the low-alloy steel will result in almost a weight parity with aluminum, by virtue of the higher strength of the steel. Speed and safety are unaffected by the change to steel.

In terms of aluminum saving, the change eliminates need for 623 tons of aluminum alloy per 1000 trainers—enough to supply 420 modern pursuit planes or 150 medium bombers.

Results of research on the utilization of low-alloy high-strength steel, started over a year ago, have been made available to other plane builders, and North American officials say that potentially the new materials may be applied to combat planes as well as trainers, opening new vistas for quantity production of all types of aircraft should the war extend into a resource-draining battle of production, which many believe likely.

Douglas Aircraft Co. has "streamlined" its six-year old shop suggestion system to conform to require-

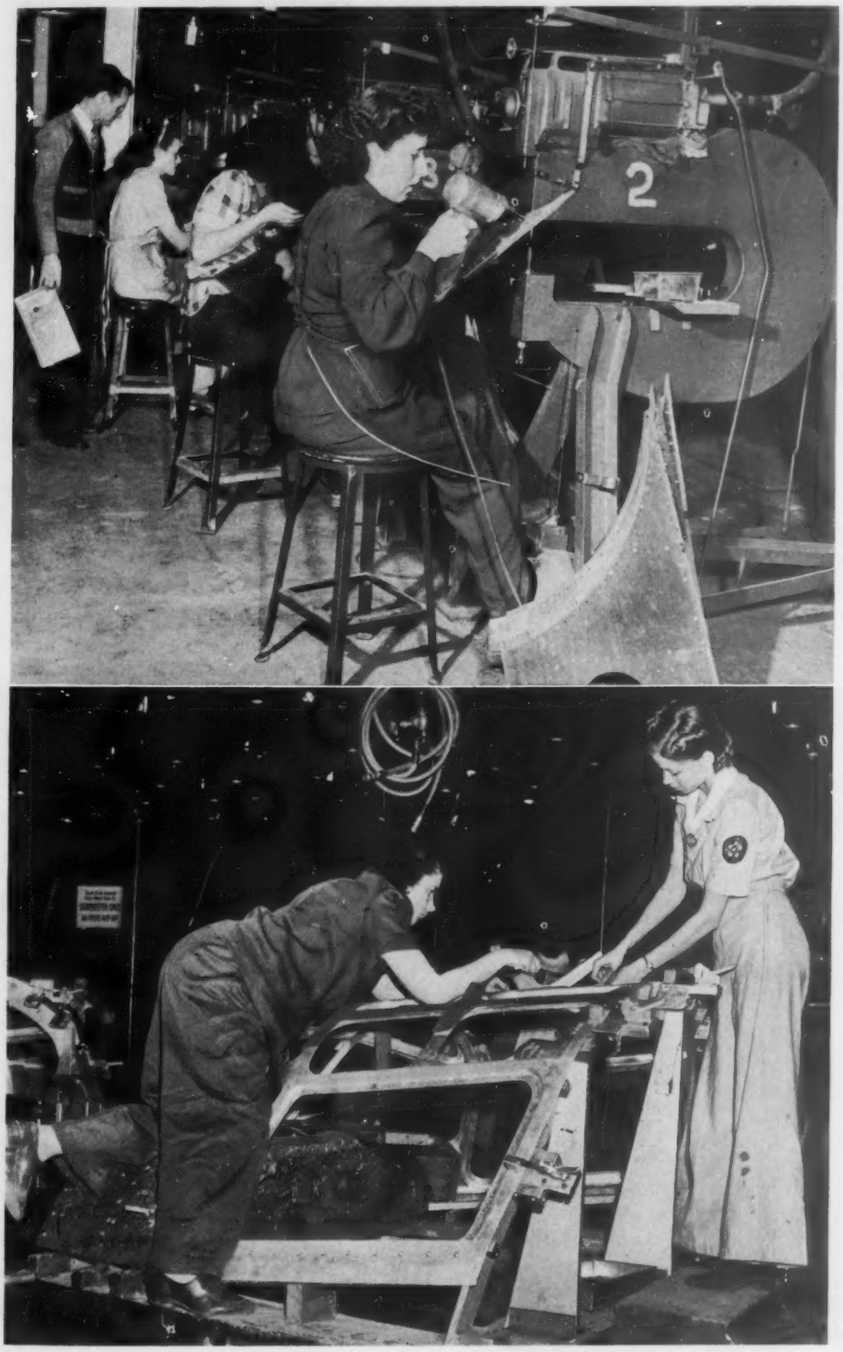
"Tokio Talks" Put Workers on Guard Against Waste

BROKEN cutters and drills, mixed rivets, imperfect parts and quantities of odds and ends, once lost as scrap, are diminishing in number since Douglas Aircraft Co., launched a campaign against waste in its California plants. "Scores of combat airplanes are being salvaged literally from the floors," it stated last week. "In 1941 the proportion of scrap to raw material handled decreased 12 per cent from 1940, and 40 per cent from 1939."

The company has had considerable success with posters—such as the one illustrated—hundreds of which are placed in its plants, and special motion pictures and shop demonstrations

ments of war production and the production drive launched by Donald M. Nelson, WPB chief. Organization of a joint employe-management committee has been effected. In past years employes have contributed a total of 4851 shop suggestions covering every phase of airplane production, and there have been 990 suggestion award winners. From the latter group an employe committee has been chosen for each plant, and one member of each of these committees will serve on the employe-management committee-of-the-whole.

President Donald W. Douglas says that while present temporary limitations on acceleration of production are those of materials and parts, the new committee will attack with vigor the problems of morale and general employe welfare to give full effect to the production drive.



WOMEN have a major role in the production of heavy bombers at Consolidated Aircraft Corp.'s large plant at San Diego, Calif. Famed B-24s now are being produced on a continuously moving assembly line (see STEEL, March 23, p. 31). Upper photo, women workers are operating drills on stampings in parts department. Lower photo, two women and a man assemble part of the nose for a B-24.
NEA photos

Tool Engineers Study War-Time Problems

ST. LOUIS, MO.

Designated as the "Key to Victory" meeting, the tenth annual convention of American Society of Tool Engineers was held in Hotel Jefferson, last week. Despite pressure under which the tool engineering profession is working the convention drew a large attendance.

Thursday morning was devoted to "conversion from peacetime to wartime production," one speaker covering contract distribution, including problems of small shops, while another dealt with managerial problems in conversion, including those involved in engineering, manufacturing and personnel.

Thursday afternoon was devoted to plant visitations, the meeting being resumed in the evening for consideration of "substitutions and shortages of materials."

Cutting tool conservation was the Friday morning theme. Three phases were dealt with. First was design of tools for maximum service. Second, keeping worn tools out of the scrap bin—through modern salvaging methods. Third, how to attain maximum tool life and maximum production through proper selection of cutting fluids.

Friday afternoon brought defense inspection to the fore, one speaker dealing with it from the government's point-of-view, the other telling industry's side of the story. The annual banquet was held Friday evening, with Frank W. Curtis, president of A. S. T. E., as chairman.

Final sessions were held Saturday morning and were devoted to mass production of aircraft. Principal matters discussed were, influence of air corps service demands on design, procurement and production; and mass production methods in aircraft engine manufacture to meet war needs.

A complete report of the convention will be published in the April 6 issue of STEEL.

Foundry Equipment Sales Index Gains in February

Foundry Equipment Manufacturers' Association, Cleveland, reports index of net orders closed on new equipment in February was 636.6, compared with 570.6 in January and 505.3 in December. Index for repairs was 631.4, compared with 418.5 in January and 408.7 in December. Total sales index was 567.9 in February, 532.7 in January and 481.2 in December.

Indexes are percentages of monthly averages of sales to metalworking industries, 1937-39.

MEN of INDUSTRY

DR. MAURICE C. FETZER, formerly assistant professor of metallurgy, Pennsylvania State College, has joined Carpenter Steel Co., Reading, Pa., as research metallurgist. He is a member, American Society for Metals, American Institute of Mining and Metallurgical Engineers and British Iron and Steel Institute.

♦

Arthur L. Olson, president, Racine Iron & Wire Works, Racine, Wis., has been commissioned a lieutenant in the United States Navy.

♦

Daniel M. Rugg, since 1930 vice president, Koppers Co., Pittsburgh, has been elected a vice president of Koppers United Co. He has been with Koppers since 1925.

♦

Harry D. Agnew, division chief in charge of telephone cable and wire manufacture, Hawthorne works, Western Electric Co., Chicago, will retire April 1 after 46 years' service.

♦

Alexander C. Brown, vice president, Cleveland-Cliffs Iron Co., Cleveland, has been appointed regional consultant for the Cleveland area in expediting Defense Plant Corp. construction work. He and **Harvey H. Brown Jr.,** a director of Eaton Mfg. Co. and Industrial Brownhoist Corp., will assist **Clarence Francis,** chief industrial consultant for DPC.

Dr. Maurice C. Fetzer

♦

H. M. Northrup, for many years chief engineer, Hudson Motor Car Co., has been appointed a vice president and placed in charge of the company's Detroit plants.

♦

Raymond H. Gardner has been named acting president, Albion Malleable Iron Co., Albion, Mich., to replace **Collins L. Carter,** who is now in Army service. Mr. Gardner will continue as chairman of the board. **Thomas T. Lloyd,** vice president, has become plant manager in direct charge of factory operations, while **Emil F. Holtz,** personnel manager, has been made plant superintendent to succeed **Kenneth H. Hamblin,** resigned.

♦

Gwilym A. Price, president, Peoples-Pittsburgh Trust Co., and **Francis Crandall,** vice president, Melbank Corp., have been elected directors, Blaw-Knox Co., Pittsburgh.

♦

W. S. Scruggs has been elected a vice president, St. Paul Hydraulic Hoist Co., Minneapolis. Associated with the motor truck and hoist industries the past 25 years, Mr. Scruggs will continue his duties as general manager.

♦

Henry W. Ruesch has been appointed a vice president, Phoenix Mfg. Co., Joliet, Ill., and Catasauqua, Pa. Heretofore assistant treasurer and office manager, Mr. Ruesch has been associated with Phoenix the past 33 years. He will continue to maintain his office at Joliet.

♦

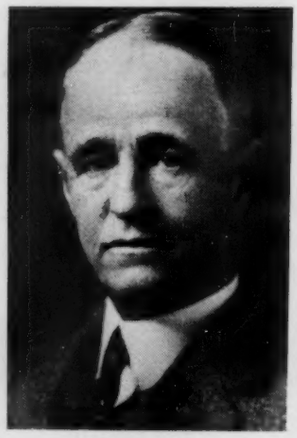
Paul W. Litchfield, president, Goodyear Aircraft Corp., Akron, O., has completed a new executive

"Never Yet Had a Man Leave Us for a 'Better Job'"

E. P. Bullard Jr., president, The Bullard Co., Bridgeport, Conn., and inventor of the Bullard vertical turret lathe, marked his fiftieth year of active participation in the firm March 10.

When Mr. Bullard was graduated from Amherst and completed a 5-cents-an-hour apprenticeship under his father, who founded the business in 1880, there were 55 employes. Now there are 5000, organized around a nucleus of men trained under an apprenticeship program maintained through depression years.

In accordance with a tradition started when Mr. Bullard's father was recalled from the Northern Army in the Civil War to make Colt pistols, and continued in World War I when machine tools and 155 mm. guns were manufactured, the firm's output of machine tools now is entirely for the nation's war effort.



E. P. Bullard Jr.

Eighteen associates, whose service totals 786 years, greeted him on his golden anniversary. He regards these men as "typical products of a liberal industrial policy."

"I have found it not only the Christian thing to do, but profitable, to pay top wages and provide every security for our employes," Mr. Bullard said.

"High wages, we have found, not only attract the most skilled workers, but keep our labor turnover near the vanishing point. We have never yet had a man leave us for a 'better job'."

The Bullard Co. has bonus systems based on savings within the plant, on individual efficiency and the volume of shipments, as well as a guaranteed wage. It was one of the first firms in the country to adopt group insurance at no cost to employes.

R. W. Aiken

Julian E. Toby

Leonard T. Beecher

Frank O. Wahlstrom

organization. **Harry E. Blythe** is vice president and general manager; **Russell De Young,** vice president in charge of manufacturing; **Dr. Karl Arnstein,** vice president in charge of engineering design; **T. A. Knowles,** sales manager; **H. D. Hoskin,** comptroller; **H. L. Riddle,** assistant treasurer; **George Sherry,** in charge of standard practice at Wingfoot Lake, and **C. H. Zimmerman,** manager of the wheel and brake division.

♦

R. W. Aiken has been named plant engineer, Jessop Steel Co., Washington, Pa. He previously was chief engineer, Frazier-Simplex Inc., Washington, Pa.

♦

Julian E. Tobey, vice president, Appalachian Coals Inc., Cincinnati, has resigned, effective April 15, to become managing director of the newly organized Coal Bureau of the Upper Monongahela Valley Association, with headquarters in Fairmont, W. Va. The bureau was formed by coal industry leaders in ten West Virginia counties and the Upper Monongahela Valley Association to exploit the vast reserves of high volatile, low fusion coals in that area.

♦

Joseph Kuchar has been elected vice president, Athey Truss Wheel Co., Chicago, to succeed **Ray Betsinger,** who has resigned to become identified with the federal government in Washington.

♦

J. T. Baral Jr., formerly advertising manager for Roberts & Mander Stove Co., Philadelphia, and R. M. Hollingshead Corp., Camden, N. J., has been appointed advertising supervisor for the foundries divisions of Baldwin Locomotive Works, Philadelphia.

♦

Ray C. Sackett, the past eight years head of the public relations department of MacManus, John & Adams Inc., Detroit, has joined the headquarters staff of the Society of Automotive Engineers Inc., to assist in accelerating the society's war program. He will have his headquarters in the New Center building, Detroit.

♦

Leonard T. Beecher, president, Southern States Iron Roofing Co., Savannah, Ga., has been elected to the newly created post of chairman of the board, effective April 1. He has been succeeded as president by **Frank O. Wahlstrom,** heretofore vice president and general manager.

M. J. Beasley, formerly manager of the company's factory and district sales office in Birmingham, Ala., has been elected vice president and will be in charge of operations. **Augustus Delpey,** auditor, has been named secretary-treasurer, and **W. Spencer Connerat,** general counsel, has become a member of the three-man board of directors.

♦

George P. Watkins has been appointed office manager, Atlanta, Ga., branch warehouse of Crucible Steel Co. of America. Mr. Watkins formerly was assistant to the company's railway division sales manager, **W. K. Krepps,** in the New York executive offices.

♦

Ralph C. Edgar has been named manager of industrial relations, Allegheny Ludlum Steel Corp., Pittsburgh. Mr. Edgar has been engaged in public relations work a number of years. Since 1936 he has been secretary, Tri-State Authority, and United States Flood Control Federation.

♦

James H. Carmine, general sales manager, Philco Corp., Philadelphia, has been elected vice president in charge of merchandising. Mr. Carmine has been associated with Philco in positions of increasing responsibility since 1923.

♦

Herbert R. Clarke, maintenance of way engineer, Chicago, Burlington & Quincy railroad, Chicago, has been elected president, American Railway Engineering Association. **Frank R. Layng,** chief engineer, Bessemer & Lake Erie railroad, Greenville, Pa., has been named vice president of the association.

♦

John W. B. Foringer has been appointed director of industrial relations, Scully Steel Products Co., Chicago. Heretofore he has been identified with the industrial relations staff of Carnegie-Illinois Steel Corp. at Pittsburgh. **George B. McConnell,** since 1927, manager, engineering department of Scully Steel Products, has been named manager of operations. He has been succeeded as manager of engineering department by **A. R. Maronde,** formerly assistant to manager of that department. **John F. Baasel,** identified with United States Steel subsidiaries 34 years, has become supervisor of accounting of the Scully organization.

♦

W. C. Campbell has joined Pioneer Engineering & Mfg. Co., Detroit, as assistant to the president, while **Charles A. Bonamy** has become assistant office manager to assist **F. C. Querry,** secretary-treasurer. Mr. Campbell formerly was with Peet, Marwick, Mitchell Co., public accountants, and Mr. Bonamy was manager, general comptometer and tabulating department, United States Rubber Co.

♦

Wayne A. Johnston, assistant to the vice president and general manager, Illinois Central railroad, Chicago, has been promoted to assistant general manager. **R. O. Fischer,** superintendent of transportation, has been granted a leave of absence for military service. His position will be filled by **S. F. Lynch.**

♦

John L. Young, manager of machinery sales, United Engineering & Foundry Co., Pittsburgh, has been placed in charge as project man-

ager of a new division of the company for construction of an aluminum sheet rolling mill plant in the West, under a contract with Defense Plant Corp., Washington. **William Hagel,** formerly assistant to sales manager, has been promoted to assistant sales manager and has assumed the duties of Mr. Young during construction of the aluminum plant.

Other personnel of the new construction organization includes: **K. C. Gardner Jr.** and **H. O. Shepard,** project engineers; **W. R. Hodder,** structural engineer; **H. F. Voigt,** specification engineer; **A. A. Straub,** chief clerk; **N. J. Crain,** general purchasing agent; **B. D. McMillen Jr.,** project purchasing agent (Pittsburgh).

Field organization will be headed by: **T. A. Frazier,** project superintendent; **G. C. Schutte,** project purchasing agent; **H. W. Fitzgerald,** plant engineer.

♦

William S. Shipley, chairman of the board, York Ice Machinery Corp., York, Pa., and founder of the York Plan for industrial co-operation in war work, was presented with a "citation of merit" at the fifth annual award dinner of the National Association of Publicity Directors held in the Waldorf-Astoria, New York, for his application of the principles of public relations in the development and furtherance of the York Plan.

♦

S. R. Puffer, designing engineer, supercharger department; **Waverly A. Reeves,** and **Dr. C. W. Smith,** technical supervisor, supercharger department, General Electric Co., Schenectady, N. Y., have been given Coffin awards by the company "for an outstanding group accomplishment in bringing the turbosupercharger enterprise through highly critical years to its present great value in the war effort."

♦

George Birkenstein & Co., 332 South Michigan avenue, Chicago, last week announced the addition of **Leo J. Messinger** to its staff.

♦

Daniel C. Green, head of the Central Service Corp., Chicago, utilities specialists, has been elected chairman of the board, Cleveland *Pneumatic Tool Co., Cleveland.* A graduate in electrical engineering from *Purdue University,* Mr. Green has operated public utilities in a number of cities. He went to Chicago in 1933 as trustee of Middle West Utilities Co., reorganized that company into the Middle West Corp., and served as president until October, 1937, when he resigned to organize Central Service Corp.

DIED:

Wilbur E. Crane, 78, president and founder, Illinois Steel Bridge Co., Jacksonville, Ill., in that city, March 20. He had been president 42 years.

♦

Ralph J. Archer, 61, vice president and general sales manager, Willys-Overland Motors Inc., Toledo, O., March 20, in Rochester, Minn.

♦

Harry H. Biggert, 66, former vice president in charge of manufacturing, J. I. Case Co., Racine, Wis., March 17, in Boston. He joined the Case company in 1928 after resigning as vice president, Emerson-Brentingham Co., Moline, Ill.

♦

Frederick P. Clark, 67, superintendent of the lead refinery, International Lead & Refining Co., East Chicago, Ind., in that city, March 16.

♦

S. Alva Moog, treasurer, St. Louis Spring Co., St. Louis, in Miami Beach, Fla., recently. He and his brother, Herbert Moog, established the company about 20 years ago.

♦

Anthony J. Bemis, 65, vice president and director in charge of the Chicago office, Day & Zimmerman Inc., consulting engineers, March 21, in that city.

♦

Peter Bendixon, 69, superintendent of the former Bettendorf Co., Davenport, Iowa, for 40 years, in that city, March 23. He retired three years ago.

♦

Edward C. Schmidt, 67, who retired two years ago as professor of railway engineering, University of Illinois, March 21, in New York. At one time he was assistant engineer, American Hoist & Derrick Co., St. Paul, Minn. He was a member, American Society of Mechanical Engineers.

♦

Arthur E. Blackwood, vice president, Norton-Lasier Co., Chicago, at his home in Winnetka, Ill., March 23. In 1933, Mr. Blackwood retired from the presidency of Sullivan Machinery Co., Michigan City, Ind., which he had served 35 years. He was a councilor, National Metal Trades Association.

♦

George A. Johnstone, 65, president, *Great Lakes Electrical Mfg.* Co., Chicago, in that city, March 23.

♦

William E. Woodard, 68, since 1916 vice president, Lima Locomotive Works, in charge of design, March 24, at his home in New York.

♦

Howard F. Gurney, 71, director of engineering, research and production, Otis Elevator Co., New York, March 23, in that city.

♦

Oliver M. Diall, 64, president, Krome-Alume Inc., Lockport, N. Y., and a former vice president, Harrison Radiator Division of General Motors Corp., March 22.

MEETINGS

To Discuss Uses of Welding In Wartime Production

About 60 papers on the use of welding in war work will be presented at the twenty-third annual meeting of the American Welding Society, Book Cadillac hotel, Detroit, Oct. 12-16.

A total of 47 fundamental research projects now are being conducted by the society. Membership in the organization is reported as 4931, in 42 local sections.

Gas Producers, Distributors To Meet in St. Louis, May 4-7

Natural Gas Convention and the Distribution Conference of the American Gas Association will be held jointly in St. Louis, May 4-7. Problems arising from loads placed on gas distribution systems supplying war industries as well as those relating to material shortages, property protection and personnel training will be discussed.

Electrification Forum In East Pittsburgh

Seventh annual Machine Tool Electrification Forum is scheduled for April 6-7 at the plant of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Features of the program are:

Monday, April 6, 10 a. m.

"The Forum for 1942" by L. F. A. Mitchell, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
"Electrification of Specialized Machines and Tools" by W. P. Beattie, American Laundry Machinery Co.
"Electric Controls as Applied to High-Speed Automatic Machinery," by V. T. Grover, American Can Co.

2 p. m.

"Variable Voltage Drives," by G. A. Caldwell, Westinghouse Electric & Mfg. Co.
"Super Finish" by O. L. Kettering, Foster division, International Machine Tool Co.

Tuesday, April 7, 9:30 a. m.

"Thread Grindings" by L. M. Davis, Jones & Lamson Machine Co.
"Balancing and Precision Motors," round table discussion, under chairman E. M. Taylor, Heald Machine Co.

2 p. m.

"Metal Cutting Forces and Power Developed in Machine Tools" by Prof. O. W. Boston, University of Michigan.
"Progress of Electrical Equipment for Machine Tools and Adaptation of Standard Equipment to Speed Production" by C. E. Greene, Monarch Machine Tool Co.
Discussion session.

7 p. m.

Annual dinner, William Penn hotel, Pittsburgh.
"Wartime Conversion in Small Plants" by F. B. Heitkamp, vice president, American Type Founders, Inc.

Activities of Steel Users, Makers

R. R. WASON, president, Manning, Maxwell & Moore Inc., Bridgeport, Conn., announced last week that the company will liquidate its railway and mill supplies division at Jersey City, N. J., which has been in operation since the late seventies as a jobbing agency for products of other industries. This will make possible strengthening and expansion of manufacturing departments of the firm's business.

♦

Pennsylvania Salt Mfg. Co., Philadelphia, last week reported an increase of 65 per cent in the staff of its industrial cleaner division as part of a plan to help metal fabricators use cleaning methods that will conserve chlorine.

♦

Copperweld Steel Co., Warren, O., is publishing a new house organ, *The Aristoloy Magazine,* containing comments on topics of the time and also information on Aristoloy alloy steels and Coppco tool steels.

♦

Allen-Bradley Co. has moved its Chicago office to larger quarters at 624-630 West Adams street. John McC. Price continues in charge as district manager.

♦

National Industries Inc., South Bend, Ind., has acquired Bass Foundry & Machine Co., Fort Wayne, Ind., and will operate it as Bass Foundry & Machine Division. Thomas W. Simmons is vice president and general manager, and George J. Morton, plant manager, of the Bass organization, which at present is manufacturing nitraters, filters and boilers for defense purposes.

♦

International Filter Co., Chicago, maker of water conditioning and allied equipment, has changed its corporate name to Infilco Inc.

♦

Oliver Bros. Inc., New York, has moved its Chicago branch from the Socony-Vacuum building to larger quarters at 327 South LaSalle street. Charles O'Mera will continue as manager at Chicago.

♦

Illinois Gear & Machine Co., Chicago, is now engaged in expanding its manufacturing facilities for the second time within a year. Present project includes $100,000 of building construction and additional machinery totaling $300,000.

♦

Acoustic Division of Burgess Battery Co. has moved to new quarters at 2815 West Roscoe street, Chicago.

♦

Power Specialty Co., Houston, Tex., has been appointed to represent the Cochrane Corp., Philadelphia, in southeastern Texas for the sale, installation and service of Cochrane meters.

♦

Day & Zimmerman Inc., Philadelphia, has received an order from Pittsburgh Ferromanganese Co., Chester, Pa., for two 22 x 100-foot hot blast stoves with welded steel shells, brick linings, piping, valves and gas burners.

♦

H. H. Crow Equipment Co., 216 East Fourth street, Little Rock, Ark., has been appointed authorized distributor for the Hoist, Body and Tank Divisions of Gar Wood Industries Inc., Detroit.

♦

Rolock Inc. is now located in its new building at 1350 Kings Highway East, Fairfield, Conn.

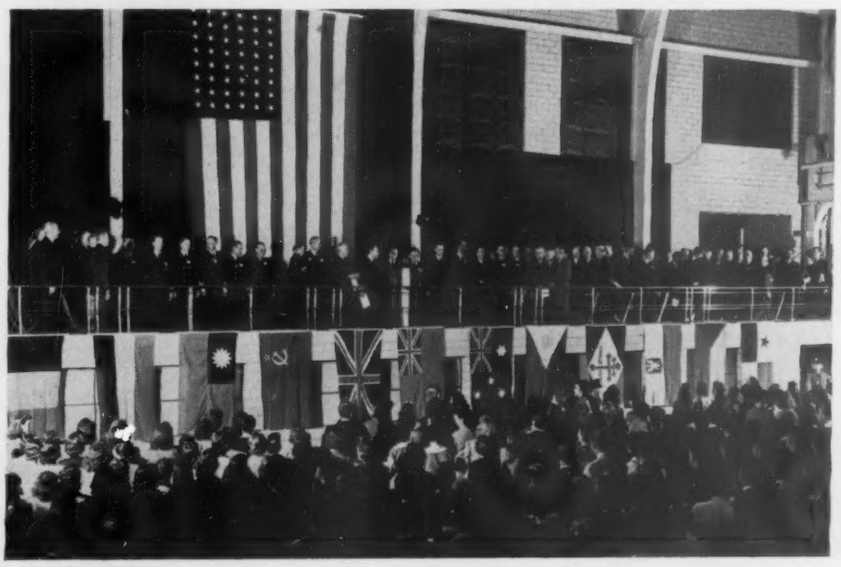
♦

With a minimum of plant expansion and installation of new machinery, Hall-Scott Motor Car Co., Berkeley, Calif., builder of the Defender and Invader engines being used in all branches of the fighting services, has doubled its production effort.

♦

National Tool Co., Cleveland, is engaged in an expansion program which will increase output 40 per cent. The company is building additions to factory units and about $500,000 of machinery, provided through Defense Plant Corp., is being installed.

Navy Honors Tool, Steel Companies for Production Excellence



In a colorful ceremony attended by John W. Bricker, governor of Ohio, and James G. Stewart, mayor of Cincinnati, Rear Admiral Clark H. Woodward, U. S. N. (Retired) presented the Navy "E" to Cincinnati Milling Machine Co., March 20. Frederick V. Geier, company president, received the pennant from Admiral Woodward. Edward Sand, dean of the employes with 58 years of service to his credit, accepted the Navy "E" lapel buttons in behalf of his fellow workers.

Included in the printed program was a list of 34 subcontractors, headed with this tribute by Mr. Geier: "To our subcontractors and to all others whose close co-operation and help have contributed so much in our production effort, we are deeply grateful. The honor of the Navy 'E' award bestowed on us today is yours as well."

Among other organizations to whom the Navy "E" recently has been given are Lukens Steel Co., Coatesville, Pa., and South Chicago Works of Carnegie-Illinois Steel Corp. Previously a general award had been made to all Carnegie-Illinois plants at a ceremony held in Pittsburgh. Rear Admiral Edward A. Evers was guest-of-honor at the South Chicago Works, where lapel buttons were distributed to 17,000 employes.

$30,000,000 in New Facilities for National Steel

ADDITIONS to plant facilities of National Steel Corp., Pittsburgh, in 1941-42 will approximate $30,000,000, according to E. T. Weir, chairman, in company's annual report. All were financed with company funds.

Earnings for 1941, after all charges, amounted to $17,102,350.05, equal to $7.75 per share on capital stock. Dividends totaled $7,146,992.75, with balance of net earnings, or $9,955,357.30, carried to earned surplus. Greater allowance for reserves was attributed to future uncertainty and heavier taxation. Total taxes were $25,985,443, twice the 1940 figure.

Importance of tin conservation was mentioned as being responsible for installation of two electrolytic lines, in addition to an experimental line now in regular production. The three lines will have total annual capacity of about 4,500,000 base boxes of tin plate.

Inland Steel Operations Averaged 103.7% in 1941

Inland Steel Co., Chicago, reports 1941 net sales amounted to $202,755,157. Net profit was $14,824,053, equal to $9.08 per share, compared with $8.87 per share in 1940.

Edward L. Ryerson, chairman, pointed out that 1941 rate of operations, based on ingot production of 103.7 per cent, was considerably in excess of the previous year. Mill shipments of finished and semi-finished steel products totaled 2,695,687 tons, compared with 2,137,997 tons in 1940.

Increase of facilities for production of defense materials at Indiana Harbor constituted the largest outlay for 1941 additions and improvements, which aggregated $4,711,211.

Universal-Cyclops Steel Corp.

Universal-Cyclops Steel Corp., Bridgeville, Pa., earned net profit in 1941 of $1,753,043. Company reserved $3,340,000 for federal income, excess profits and state income taxes.

Pittsburgh Steel Co.

Pittsburgh Steel Co., Pittsburgh, reports 1941 net profit for parent company and subsidiaries of $3,169,597, after provision of $3,625,000 for federal taxes.

Birdsboro Steel Foundry

Net profit of $453,083 for 1941 is reported by Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., after providing $853,923 for state, federal and excess profits taxes and $40,000 reserve for contingencies.

Sloss-Sheffield Steel Co.

Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., shows 1941 net profit of $1,261,502, after reserve for contingencies and provision of $790,030 for federal income and excess profits taxes.

A. O. Smith Corp.

Report for the quarter ended Jan. 31, 1942, of A. O. Smith Corp., Milwaukee, and subsidiaries, Smith Meter Co. and Sawyer Electrical Mfg. Co., shows net profit of $691,356, after federal and state income and federal excess profits taxes of $776,962.

Koppers Co.

Koppers Co. reports consolidated 1941 earnings of $6,656,860 available for dividends on company's 6 per cent cumulative preferred stock, compared with $3,934,832 in 1940. After preferred dividends, earnings applicable to common stock were $5.46 a share in 1941, against $2.73 a share in 1940. A 90-cent dividend was paid on the common this year.

Company reports total 1941 sales of $83,826,805, an increase of 51 per cent over 1940.

Wickwire Spencer Steel Co.

Wickwire Spencer Steel Co. reports its output for direct and indirect war purposes as 75 per cent of the total. An increase in the percentage is anticipated, according to E. C. Bowers, president.

"Record production was attained in 1941, in pig iron, ingots, billets, rods and a large variety of products," he said.

Net profit for the year amounted to $1,578,462, compared with $13,767 in 1940. Sales were 52.8 per cent greater than in 1940.

Follansbee Steel Corp.

Follansbee Steel Corp., Pittsburgh, reports 1941 net profit as $445,963 on net sales of $15,430,144. This represented a net of $1.46 per common share.

Taxes amounted to $523,370; depreciation and amortization, $572,143.

On July 1, 1940, assets of Follansbee Bros. Co. were transferred to the corporation by court order.

Army Noncoms Inspect Fuze Heads Made By Women

FUZE heads manufactured in the Philco plant at Philadelphia are inspected by noncommissioned Army officers from Fort Dix, N. J. Women are employed by Philco for certain operations on this type of munitions work. NEA photo

U. S. Steel Installs Electro Plating Lines To Save 6,750,000 Pounds Tin

UNITED STATES Steel Corp. announced last week that it is taking immediate steps to stretch its part of the limited supply of pig tin to meet the nation's essential needs. New electrolytic tin plating facilities, costing approximately $10,000,000 and contributing to the conservation of an estimated 6,750,000 pounds of pig tin each year will be installed at subsidiary companies' plants in the Chicago, Pittsburgh and Birmingham districts.

These installations will supplement similar electrolytic coating lines announced by United States Steel February 10 which are now under construction at an estimated cost of $5,500,000. Both programs are being undertaken with the corporation's own funds. All of these facilities are expected to be in operation within 12 months.

New Lines for Black Plate

In addition to construction of electrolytic lines, the corporation will also install six lines for chemical treatment of black plate. Thus two chemical treatment lines, and two electrolytic coating lines will be installed in the Pittsburgh district and two of each in the Chicago area by Carnegie-Illinois Steel Corporation. Tennessee Coal, Iron & Railroad Co. will install two electrolytic and two chemical treatment lines in the Birmingham area.

The new electrolytic lines will have a combined annual capacity of approximately 9,000,000 base boxes or 450,000 tons. Capacity of the new chemical treatment lines will be 3,000,000 base boxes or 150,000 tons annually.

The economy of tin due to the use of the electrolytic method permits application of an equal amount of tin to a far greater area of plate and thereby contributes to the solution of the national problem of tin conservation. The conventional hot dip method of applying tin to steel requires at least 1.25 pounds of tin per base box (100 pounds). With the electrolytic method, a satisfactory coating of tin can be applied by using a 0.5-pound coat per base box. It is possible with the electrolytic method to produce coatings lighter than 0.5-pound per base box and where this product can be used proportionately larger savings may be effected.

Coating of 9,000,000 base boxes by the conventional method would require approximately 5625 tons of pig tin. The same quantity of plate can be electrolytically coated by using only 2250 tons of tin. Operating at rated capacity, the electrolytic lines will therefore conserve an estimated 3,375 tons of tin each year.

Most of the chemically treated black plate will later be lacquered by canmakers and will be used where appropriate in applications formerly served by tin plate. Applied in this manner the 3,000,000 base boxes of chemically treated black plate will indirectly effect a saving of 3,750,000 pounds of tin per year.

Two More Blast Furnaces To Be Built in Canada

TORONTO, ONT.

TWO more blast furnace stacks are to be built in Canada, one at Sault Ste. Marie, Ont., and the other at Sydney, N. S., to be in production early next year. Details have not been disclosed.

Steel Co. of Canada, Hamilton, Ont., in its annual report states it has undertaken expenditures of $9,000,000 to $10,000,000 for new plant facilities to meet war demands. Additionally the Canadian government has made an advance of $4,150,000 for construction of a blast furnace

"Big Steel" Establishes Tubular Products Subsidiary

United States Steel Corp. last week announced creation of Tubular Products Inc., a subsidiary, "to increase production of seamless tubing of alloy and stainless steel essential to the war effort." The company acquired the existing plant of National Tube Co. at Gary, Ind., and "will begin operations shortly."

Benjamin F. Harris, president, National Tube, is president of Tubular Products. The list of officers is represented in the accompanying photograph. In addition, L. W. Mason is manager of purchases. These officials formerly held positions in National Tube and "were chosen for their experience in . . . development of new plant facilities, such as the establishment in 1940 of bomb and shell manufacturing plants."

It was emphasized that Tubular Products' principal output will be "for the Army, Navy and Maritime Commission requirements, including tubing for aircraft structures, motor parts, bearings, tanks, tractors, oil refineries, and many other applications."

Seated, left to right: E. N. Sanders, vice president; B. F. Harris, president; L. W. Mason, manager of purchases. Standing, left to right: E. M. Moore, comptroller; A. Gordon Patterson, secretary and treasurer; R. W. Wire, manager of sales

and an open hearth furnace, a project previously reported. This sum is to be covered by special depreciation over three years. An initial payment of $1,660,000 was made during the past year.

To increase raw material supply for steelmaking the steel controller has notified automobile wreckers that all scrap on hand must be sold within 90 days with permission to salvage usable parts. After 90 days stocks will be taken over by the Department of Munitions and Supply.

Restrictions on manufacture of a wide variety of civilian articles go into effect April 1, to conserve steel for war use. Production of some essential articles will be included in the order.

Steel production is being maintained at the limit of raw material supply and is expected to reach a record total of 3,200,000 net tons, which will be 2,000,000 tons short of requirements. The remainder must be imported, if possible, but receipts from the United States have not been sufficient recently to meet needs.

To prevent hoarding or misuse of steel, tin, zinc, copper and other essential raw materials, it has been made an offense for any manufacturer to use these materials for any other purpose than those for which they were released by the Wartime Industries Control Board or other government agency. Unused surplus must be reported and held subject to order by the government.

A new government-owned company, Wartime Metals Corp., has been formed, with head offices in Montreal, which will assume responsibility for arrangements that have been made for production of metallic magnesium in Canada. Jules R. Timmins, Montreal, is president; J. H. C. Waite, Toronto, R. E. Stavert, Montreal, James G. Ross, Thetford Mines, Que., and J. E. Perrault, K. C., Quebec, are directors.

Sliding Roof Vents In New War Plant

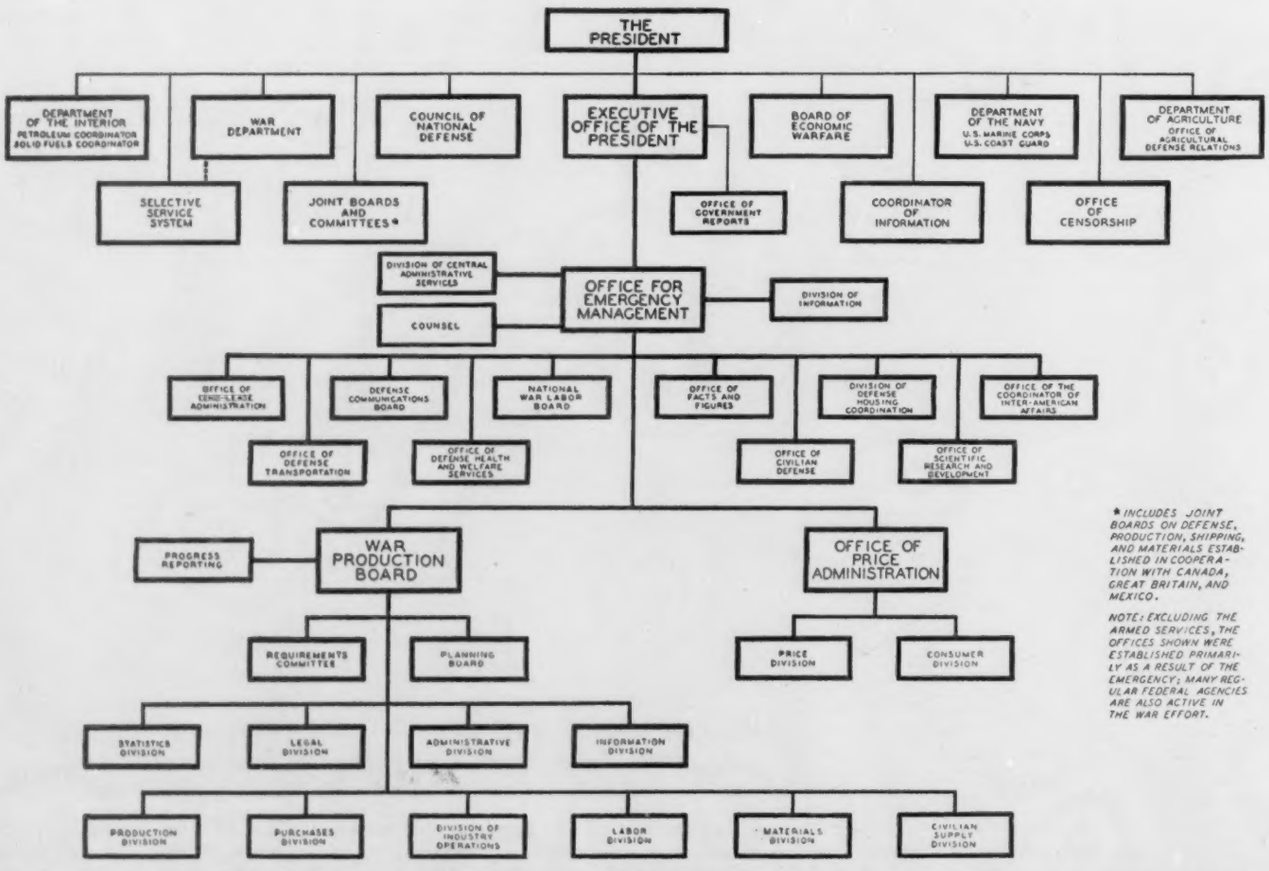
Construction of a new breech ring building for the Ohio Steel Foundry Co., Lima, O., has been started. Sliding roof vents, motor-driven and traveling on standard railroad rails, are among the innovations incorporated in its design. In summer, the vents will remain open while the plant is in operation, thus providing abundant ventilation and light. In winter, ventilation will be supplied by large fans, mounted directly in the centers of the vents.

Designed by Albert Kahn Associated Architects & Engineers Inc., Detroit, the 775-foot building will house a series of electric furnaces and a machine shop. The structure will be connected with the plant's new personnel building, also to be built this spring, by means of a tunnel passing under railroad tracks that bisect the company's site. The company's expansion program also includes the building of an addition to the present foundry building.

ADDITIONAL COPIES AVAILABLE

IF YOU would like extra copies of this week's poster, "Only More Will Win the War", for use on your factory or office bulletin boards they are available from STEEL, Readers Service Department, Penton Building, Cleveland, Ohio.

United States War Organization Today



*INCLUDES JOINT BOARDS ON DEFENSE, PRODUCTION, SHIPPING, AND MATERIALS ESTABLISHED IN COOPERATION WITH CANADA, GREAT BRITAIN, AND MEXICO.

NOTE: EXCLUDING THE ARMED SERVICES, THE OFFICES SHOWN WERE ESTABLISHED PRIMARILY AS A RESULT OF THE EMERGENCY; MANY REGULAR FEDERAL AGENCIES ARE ALSO ACTIVE IN THE WAR EFFORT.

CHART compiled by National Industrial Conference Board Inc., New York, from data supplied by Office of Government Reports

ONLY

WILL *Win*

More THE WAR

Sub-Contract Opportunities

Data on subcontract work are issued by local offices of the Contract Distribution Branch, WPB. Contact either the office issuing the data or your nearest district office. Data on prime contracts also are issued by Contract Distribution offices, which usually have drawings and specifications, but bids should be submitted directly to contracting officers as indicated.

Philadelphia office, Contract Distribution Branch, Production Division, WPB, Broad Street Station Building, reports the following subcontract opportunities:

14-B10-7: War Production Board, Washington (Conversion Unit) is trying to locate facilities for manufacture of Hamilton beveled and flat washers. Materials required: Chrome-tungsten alloy steel forgings. Heat treated and to be furnished by prime contractor. Tolerances .001. Quantity: 10,000 per month at 24-hour day, 576-hour month. Following equipment necessary: Ten Fay automatic lathes, two Campbell cutoff machines, three No. 25 Fafnir lathes, two No. 18 hand Blanchard, one Garrigus surface grinder, two Norton hydro-lappers, two 10-inch Norton plain grinders, four automatic screw machines, two centerless grinders, magnaflux testing, hardness testing, drawing and annealing furnaces.

15-B7-1: An East Hartford, Conn., firm requires subcontracting facilities on counterweight brackets, counterweight caps, counterweights, cylinder heads, pistons, front cone, rear cone and combination wrench. Tools required: Small drop hammer forgings, drilling up to ⅞-inch, turret lathes No. 1 and 2, milling machines No. 2 and 3, automatic screw machines 3⅛-inch, cadmium and chromium plating, bonderizing, heat treating and grinding. Steel to be SAE 6135-4640-1035-6150. Tolerances .001. Plans and specifications on file at Philadelphia office and parts on view at exhibits room.

15-B8-3: A Harrisburg, Pa., firm requires subcontracting facilities on the following items: Bolts and nuts ¼ x 1½-inch diameter ½ to 7 inches in length, and studs ⅝ to 1½-inch diameter 2½ to 8¾-inches in length. Material SAE 1035. Tolerances commercial. Quantity, 16,625 bolts and nuts and 7715 studs. Necessary tools include single-spindle automatic screw machines or small turret lathe and bolt threading and tapping machine.

15-B9-1: A Cleveland, O., firm requires subcontracting facilities for manufacturing the following: Contact for small selector switch, 500 each, parts are ⅞-inch long, .265 wide and .045 thick; temp. limit bracket, 500 each; parts are 1¾-inches long, ½-inch wide, 14 lbs.; contact for cable plug (Middle), 500 each, ¾-inch long, .516-D, 25 lbs., and contact for cable plug (outside), 500 each, $\frac{13}{16}$-inch long, .775-D, 22 lbs. Material C. R. copper tinned on both sides and metal brass, 22-gage, hard brass and silver plate. Tolerance .001. Tools necessary: Small stamping presses. Production to start as soon as possible. Prints and specifications on file at this office.

15-B10-1: A Philadelphia manufacturer requires subcontracting facilities on water pump gears, engine sleeves and friction cones. Material is brass SAE 40 and 2345 and bar steel 3¼-inch diameter. Tolerances .001 to .005. Quantities: 100 to 500 on various items. Equipment required: Turret lathes, gear hobber, drill presses, brass and bronze castings.

15-B10-2: A Cleveland, O., firm requires subcontracting facilities on airplane landing gear, various types of cylinders and pistons. Material required, bar steel, steel tubing and steel forgings, furnished by prime contractor. Tolerance .001. Quantity, 75 to 500 per month, depending on part. Equipment required: Single-spindle automatic screw machines (large size), heavy duty turret and engine lathes, millers, drill presses, external and internal grinders, heat treating and sandblasting equipment, atomic welding equipment and magnafluxing.

16-B8-1: A Philadelphia firm requires subcontracting facilities on the following: Seamless steel tubing from .84 to 15-inch diameter, 38,700 feet required. Hydraulic manifolds required. Steel castings under 500 pounds. Bronze and copper-silicon castings 10 to 100 pounds Tolerances .001 to .005. Electric steel castings average 400 pounds. Is a rush item.

13-B9-1: A Cleveland, O., firm requires subcontracting facilities on miscellaneous automotive parts, including steering knuckle arms, shifter yokes, various thrust and key washers, king pins and various bushings. Tools necessary include: Production lathes, drop forge diesinking equipment, drop forging hammers, heat treating equipment and cylindrical grinders. Prints and specifications on file in this office.

2-B10-1: The government is lining up facilities required for manufacture of shot, AP 20MM, M75. Shot has two component parts, body and rotating band. Materials required—steel, cold drawn commercial and copper tubing, Class A, Spec. 50-27-1 or gilding metal. Tolerances, .002 smallest. Parts range from 3½-inches long to .780-inches maximum diameter. Tools required: Automatic multi-spindle screw machines, knurling equipment or scoring facilities, bending equipment for compressing copper or applying gilding metal.

2-B10-2: Government is lining up facilities for manufacturing shot, A.P. and S.A.P. to 37MM and H.E. shell, 37 MM, M63 and shell 40 MM, H.E. Component parts consist of bodies, rotating bands, nose plugs and base plugs. Material to be furnished by subcontractor, is bar steel or forgings and gilding metal tubing, copper tubing, aluminum alloy. Smallest tolerances .0056-inch. Parts for the 40MM job are 5.17-inch long, O.A. and 1.569-inch maximum diameter. Parts for 37 MM job are 5.92-inch long, O.A. and 1.497-inch maximum diameter. Tools required are automatic multi-spindle screw machines, not less than 1⅛-inch for 37MM job, 1⅝ for 40MM job, each machine equipped for cutting fine internal threads. Banding equipment for compressing copper and equipment for applying gilding metal bands. Knurling or notching facilities and diecasting facilities.

Chicago office, Contract Distribution Branch of WPB, 20 North Wacker Drive, is seeking contractors for the following:

4-N-302: Chicago area prime contractor is arranging to subcontract work for 50 parts. These parts are of miscellaneous shapes, both simple and intricate. Drawings in this office for reference. Nominal sizes ranging from ⅝" to 5" O.D., comprising sleeves, plugs, outer and inner bearing races and cages, spacers, bell cranks, impellers, etc. Material mostly steel, some cast iron and some bronze. Machine tools required will include hand and automatic screw machines, turret lathes, horizontal and vertical milling, surface grinding. Rotary external and internal grind very essential on some parts. Some centerless and thread grinding. Lapping also indicated and heat treatment. Tolerances close to commercial. All material, tools, jigs, and fixtures must be furnished by subcontractor. Yearly requirements run from 250 to 16,000 pieces. Monthly requirements will be from 40 pieces to 2500 pieces. Priority rating is A3 and A-1-A.

Government Inquiries

The following prime contracts are pending, with closing dates for bids as indicated. QR refers to quantity required. Bidding forms on these items can be obtained only by wiring, mentioning schedule number, to the Procurement Branch of the service heading the list of requirements. Field offices of Contract Distribution Branch, WPB, generally have available for inspection and examination, schedules, invitations, specifications and drawings (where required) concerning these contracts.

BUREAU OF SUPPLIES, ACCOUNTS, NAVY DEPARTMENT, WASHINGTON

672—Target towing hawsers, galvanized wire 1-inch diameter, high grade plow steel, 1000 fathoms, QR 184. Bids April 3.

696—Boat chains, iron or steel, galvanized, diameter of wire ⅝-inch, QR 693. Bids April 10.

691—Steel bolts and nuts, QR moderate to large. Bids April 10.

476—Ammunition boxes, mark 1, for 40-mm. ammunition, QR 1,037,500. Bids April 17.

621—Nails, tacks, brads and spikes, QR large. Bids April 3.

692—Bolts and nuts, steel, varying quantities of numerous types and sizes. Bids April 10.

708—Pumps, centrifugal, motor-driven; spare parts; tools and wrenches, QR 116. Bids April 9.

715—Nickel-chromium alloy, ⅝-inch rod, QR 140,000 pounds. Bids April 10.

722—Nuts, steel, QR 194,300. Bids April 3.

PUGET SOUND NAVY YARD, BREMERTON, WASH.

4431-A—Steel tubing, structural, lap or electric welded, 1.05 and 1.315-inch, QR 1200 feet of each size. Bids April 2.

4883 — Bolts, hexagon head and stud bolts, machine, brass and steel, QR 51,200. Bids March 31.

4478-A—Fittings, tube, flared; adapters, couplings, elbows, nuts, tees, brass, QR small. Bids April 1.

4890 — Black thimbles, QR 375, and shackles, drilled and machined, 1-inch, QR 112. Bids April 7.

4892—Copper wire, and phosphor bronze, spring, QR large. Bids April 7.

4906—Drill press, complete with motor and controller, QR 3. Bids April 2.

4908—Forgings, naval brass, QR 4400 Bids April 1.

4909—Engine lathe, 14 x 30-inch centers, QR 3. Bids April 1.

4940—American standard files, round and square, QR 2534. Bids April 3.

4941 — Twist drills, H.S.S. 11/64 and 11/32-inch QR 2196. Bids April 3.

4960—Wire rope, steel, plow, high grade, galvanized, 6 x 37 regular lay, ⅝-inch, QR 2400 feet. Bids April 3.

4971—Steel, welding quality, $\frac{7}{16}$ and 1½-inch, QR 55,000 pounds. Bids April 4.

4972—Nails, iron or steel, zinc coated, copper, QR 4600 pounds; tacks, QR 2360 pounds. Bids April 3.

Advisory Groups For Industries Consuming Steel

WASHINGTON

INDUSTRY Advisory Committees for a number of iron and steel consuming groups have been appointed by the WPB. These include a government presiding officers and representatives of the industry.

Recent appointments include:

Machine Tools

Government presiding officers, George Brainard, chief, Tools Branch.

Committee members: H. S. Beal, C. B. Cottrell & Sons, Westerly, R. I.; A. G. Bryant, Cleereman Machine Tool Co., Green Bay, Wis.; Ralph W. Burke, Kearney & Trecker Corp., Milwaukee; Ralph E. Flanders, Jones & Lamson Machine Co., Springfield, Vt.; A. K. Ingle, Consolidated Machine Tool Corp., Rochester, N. Y.; R. F. Ingram, Landis Tool Co., Waynesboro, Pa.; George H. Johnson, Gisholt Machine Co., Madison, Wis.; T. S. Ross, Rivett Lathe & Grinder Inc., Boston; W. W. Tangemen, Cincinnati Milling Machine Co., Cincinnati; R. J. Whiting, Hydraulic Press Mfg. Co., Mt. Gilead, O.; J. F. Miller, Ex-Cell-O Corp., Detroit.

Laundry, Dry Cleaning Machinery

Government presiding officer, N. G. Burleigh, chief, Industrial and Office Machinery Branch.

Committee members: A. Matthews, The American Laundry Machinery Co., Cincinnati; George E. Bowdoin, U. S. Hoffman Machinery Corp., New York; Leonard S. Smith Jr., National Marking Machine Co., Cincinnati; A. R. Braun, The Prosperity Co. Inc., Syracuse, N. Y.; H. H. Harlan, Troy Laundry Machinery Division, American Machine & Metals Inc., East Moline, Ill.; Hubert C. Ellis, The Ellis Drier Co., Chicago; W. M. Cissell, W. M. Cissell Mfg. Co., Louisville, Ky.; A. R. Patten, Patten Bros. Inc., Fall River, Mass.

Cast Iron Soil Pipe, and Fittings

Government presiding officer, W. W. Timmis, chief, Plumbing and Heating Branch.

Committee members: P. A. Thompson, Williamstown Foundry Corp., Williamstown, N. J.; D. G. Burkert, The Eastern Foundry Co., Boyerstown, Pa.; J. R. Hedges, Hedges-Walsh-Weidner Division, Combustion Engineering Co. Inc., Chattanooga, Tenn., William B. Neal, Gadsen Iron Works Inc., Gadsen, Ala.; W. Frank Dowd, Charlotte Pipe & Foundry Co., Charlotte, N. C.; William H. Deyo, Anniston Foundry Co., Anniston, Ala.; William B. Byrd Jr., Alabama Pipe Co., Chicago; J. L. Tinning, Hercules Foundries Inc., Los Angeles; Michael J. Harvey, Tyler Iron & Foundry Co., Tyler, Tex.; J. J. Crotty, The Central Foundry Co., New York.

Motorized Fire Apparatus

Government presiding officer, George W. Angell, Safety and Technical Equipment Branch, Fire Equipment Section.

Committee members: H. B. Spain, The Seagrave Corp., Columbus, O.; E. L. Maxim, Maxim Motor Co., Middleboro, Mass.; E. J. Wendell, Hale Fire Pump Co. Inc., Conshohocken, Pa.; H. J. Anderson, American Marsh Pumps Inc., Battle Creek, Mich.; L. W. Gardner, Howard-Cooper Corp., Portland, Oreg.

Metal, Wire Lath

Government presiding officer, J. L. Haynes, chief, Building Materials Branch.

Committee members: S. F. Bartlett, U. S. Gypsum Co., Chicago; T. C. Phillips, Pittsburgh Steel Co., Pittsburgh, Pa.; C. M. Cooper, Bostwick Steel Lath Co., Niles, O.; William M. Goldsmith, Goldsmith Metal Lath Co., Cincinnati; Frank Horton, Alabama Metal Lath Co., Birmingham, Ala.; Kenneth D. Mann, Truscon Steel Co., Youngstown, O.; C. A. Vander Pyl, E. H. Edwards Co., San Francisco; Ralph Burley, National Gypsum Co., Buffalo; G. A. Sagendorph, Pennsylvania Metal Co. Inc., Boston; L. M. Steenrod, Consolidated Expanded Metal Companies, Wheeling, W. Va.; W. B. Turner, Milcor Steel Co., Milwaukee; Charles C. Wickwire, Wickwire Bros., Cortland, N. Y.; Edward Wilson, Ceco Steel Products Corp., Omaha, Nebr.

Fire Sprinkler

Government presiding officer, George W. Angell, Safety and Technical Equipment Branch, Fire Equipment Section.

Committee members: I. W. Knight, Grinnell Company Inc., Providence, R. I.; A. B. Crowder, Crowder Bros. Inc., St. Louis; Frank J. Fee Jr., Reliable Automatic Sprinkler Co. Inc., Mt. Vernon, N. Y.; W. K. Hodgman Jr., Hodgman Mfg. Co., Taunton, Mass.

Metal Office Furniture

Government presiding officer, W. A. Adams, assistant chief, Furniture Industry Branch.

Members are: J. E. Larson, Art Metal Construction Co., Jamestown, N. Y.; R. W. Mick, Harter Corp., Sturgis, Mich.; R. A. Cramer, Cramer Posture Chair Co., Kansas City, Mo.; Earl D. Power, Lyon Metal Products Inc., Aurora, Ill.; H. J. Onions, Warren, Pa.; E. F. Daily, Meilink Steel Safe Co., Toledo, O.; H. H. Lynn, Mosler Safe Co., Hamilton, O.; Thomas E. Miller, Shaw Walker Co., Muskegon, Mich.; G. Ruck, Columbian Steel Equipment Co., Philadelphia; Arthur R. Rumbles, Remington-Rand Inc., Buffalo; Charles E. Attwood, Acme Visible Records Inc., Chicago; L. S. Hamaker, Berger Mfg. Division of Republic Steel Corp., Canton, O.; W. J. Schaefer, Interior Steel Equipment Co., Cleveland; Gleeson Murphy Jr., Murphy Chair Co., Owensboro, Ky.; Edward C. Keyworth, Collier Keyworth Co., Gardner, Mass.; R. J. Burke, Worley & Co., Pico, Calif.; E. A. Purnell, General Fireproofing Co., Youngstown, O.

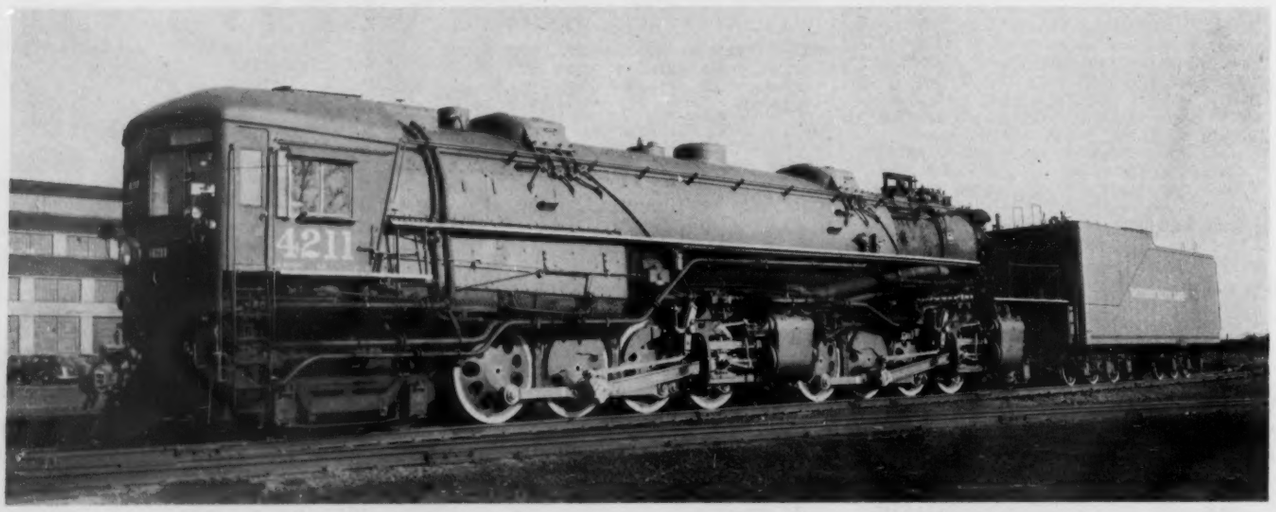
Production of Metal Windows Restricted by War Board

Strict controls have been placed by WPB on the production and distribution of metal windows.

Restrictions, contained in Limitation Order L-17, cover metal sashes, metal casements and other metal frameworks designed for window installations, and their accessories.

Manufacturers may make metal windows only for orders which bear an A-2 or higher preference rating, or on which work has already begun.

Forty Heavy-Duty Locomotives Ordered by Southern Pacific



FORTY of these heavy-duty, oil burning freight and passenger steam locomotives have been ordered by the Southern Pacific Lines from the Baldwin Locomotive Works, Philadelphia. Engines cabs are in front for greater visibility. Locomotives are of the 4-8-8-2 class, with four cylinders, a tractive force of 124,300 pounds. Engine and tender weigh 1,051,200 pounds; tender holds 6100 gallons of oil and 22,000 gallons of water

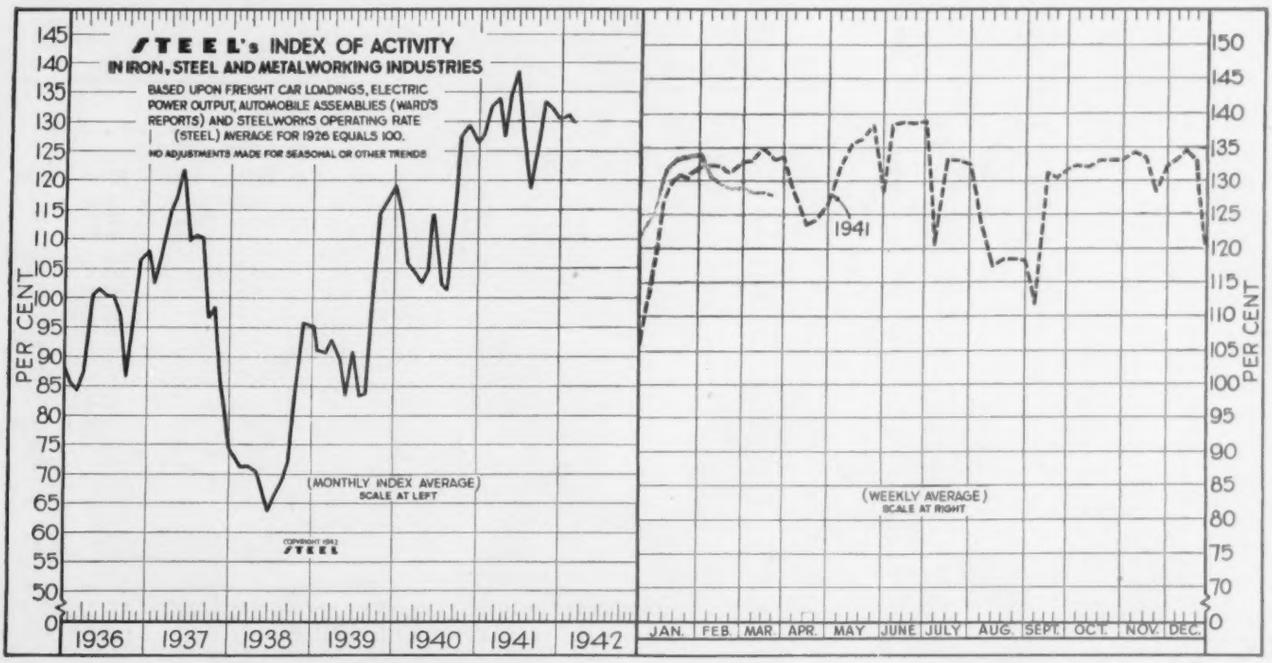
The *BUSINESS TREND*

Index of Activity Steady at 128 Level

MEASURED by STEEL'S index, pace of industrial activity in the iron, steel and metalworking industries has recorded little change so far this month. The index held steady near the 128 level for the third consecutive week during the period ended March 21. Peak recorded this year was 133.9 in the week of Jan. 31, while a year ago the index stood at 133.5.

Steelmaking operations were unchanged at 95.5 per cent of capacity during the week ended March 21. However, last week the national steel rate reached the best level recorded this year, and on a tonnage basis was at an all-time high. Heavier movement of steel scrap, due to milder weather and more intensified collection effort resulting from numerous scrap drives throughout the country, is cited as the chief reason for the recent upturn in steel output.

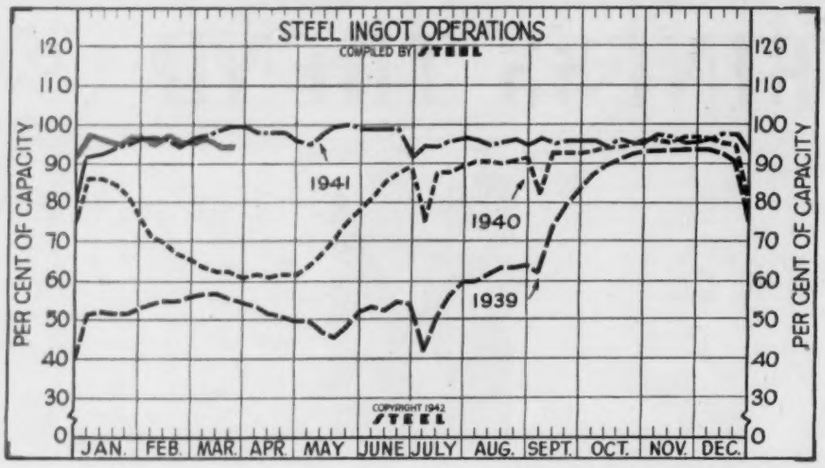
Carloadings declined to 796,640 cars in latest period. Movement of iron ore and coal should bolster freight traffic over the coming weeks. A year ago traffic totaled 768,508, while the peak last year was 922,884. Electric power consumption held substantially unchanged at 3,357,032,000 kilowatts during the latest week, a gain of 12.5 per cent above the corresponding 1941 period.



STEEL'S index of activity declined 0.2 point to 128.1 in the week ended March 21:

Week Ended	1942	1941
Jan. 10	131.2	128.2
Jan. 17	133.1	130.8
Jan. 24	133.7	130.7
Jan. 31	133.9	132.0
Feb. 7	130.6	132.7
Feb. 14	129.8	132.3
Feb. 21	129.0	131.2
Feb. 28	129.1	133.0
Mar. 7	128.3	133.1
Mar. 14	128.3	135.0
Mar. 21	128.1	133.5

Mo. Data	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
Jan.	131.3	127.3	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1
Feb.	129.6	132.3	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5
March	.....	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4
April	.....	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0
May	.....	134.8	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6
June	.....	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1
July	.....	128.7	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3
Aug.	.....	118.1	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4
Sept.	.....	126.4	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3
Oct.	.....	133.1	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2
Nov.	.....	132.2	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4
Dec.	.....	130.2	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3



Steel Ingot Operations

(Per Cent)

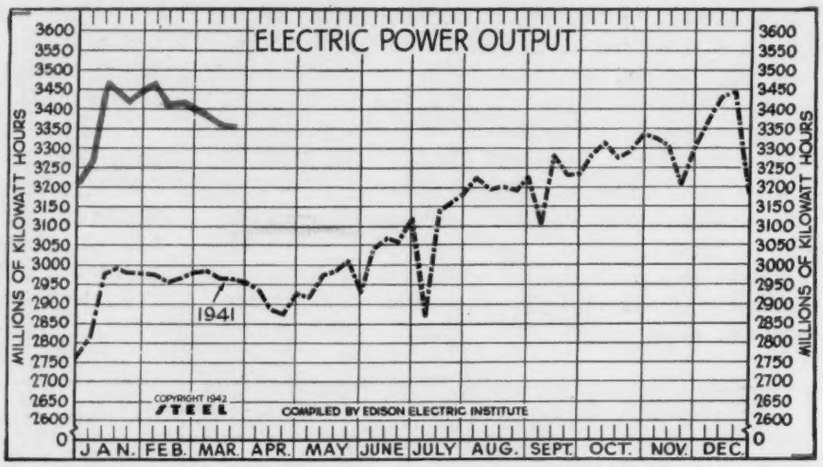
Week ended	1942	1941	1940	1939
Mar. 21....	95.5	99.5	62.5	55.5
Mar. 14....	95.5	98.5	62.5	56.5
Mar. 7.....	96.5	97.5	63.5	56.5
Feb. 28....	96.0	96.5	65.5	56.0
Feb. 21....	96.0†	94.5	67.0	55.0
Feb. 14....	97.0	96.5	69.0	55.0
Feb. 7....	96.0	97.0	71.0	54.0
Jan. 31....	97.0	97.0	76.5	53.0
Jan. 24....	97.0	95.5	81.5	51.5
Jan. 17....	96.0	94.5	84.5	51.5
Jan. 10....	96.5	93.0	86.0	52.0
Jan. 3....	97.5	92.5	86.5	51.5
Week ended	**1941**	**1940**	**1939**	**1938**
Dec. 27....	93.5	80.0	75.5	40.0
Dec. 20....	97.5	95.0	90.5	52.0

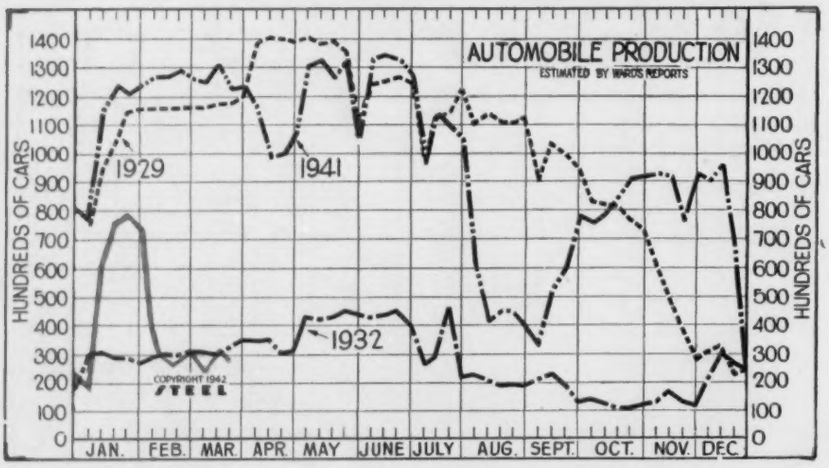
†Since Feb. 21 rate is based on new capacity figures as of Dec. 31 last.

Electric Power Output

(Million KWH)

Week ended	1942	1941	1940	1939
Mar. 21.....	3,357	2,964	2,508	2,258
Mar. 14.....	3,357	2,965	2,550	2,276
Mar. 7.....	3,392	2,987	2,553	2,285
Feb. 28.....	3,410	2,982	2,568	2,294
Feb. 21.....	3,424	2,968	2,547	2,269
Feb. 14.....	3,422	2,959	2,565	2,297
Feb. 7.....	3,475	2,973	2,616	2,315
Jan. 31.....	2,468	2,978	2,633	2,327
Jan. 24.....	3,440	2,980	2,661	2,340
Jan. 17.....	3,450	2,996	2,674	2,342
Jan. 10.....	3,473	2,985	2,688	2,329
Jan. 3.....	3,287	2,831	2,558	2,239
Week ended	**1941**	**1940**	**1939**	**1938**
Dec. 27.....	3,234	2,757	2,465	2,175
Dec. 20.....	3,449	3,052	2,712	2,425
Dec. 13.....	3,431	3,004	2,674	2,390
Dec. 6.....	3,369	2,976	2,654	2,377


ELECTRIC POWER OUTPUT
MILLIONS OF KILOWATT HOURS
1941
COPYRIGHT 1942 STEEL
COMPILED BY EDISON ELECTRIC INSTITUTE
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.



Auto Production

(1000 Units)

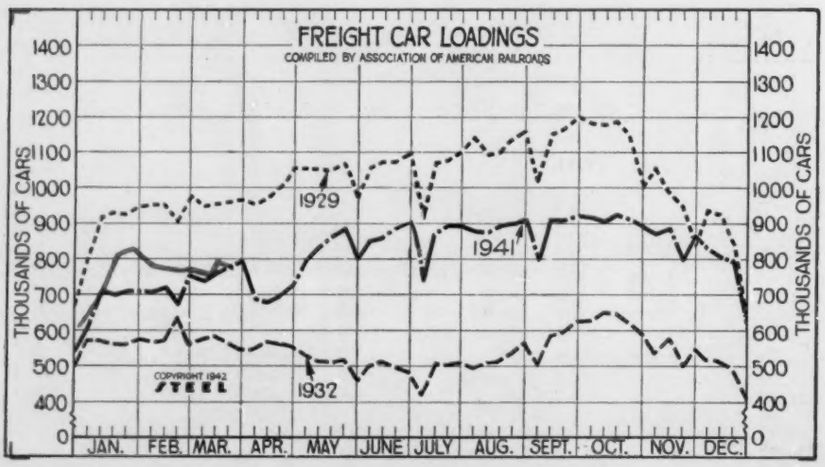
Week ended	1942	1941	1940	1939
Mar. 21....	28.9	123.8	103.4	89.4
Mar. 14....	30.6	131.6	105.7	86.7
Mar. 7.....	24.5	125.9	103.6	84.1
Feb. 28....	30.1	126.6	100.9	78.7
Feb. 21....	25.7†	129.2	102.7	75.7
Feb. 14....	29.8	127.5	95.1	79.9
Feb. 7....	37.1	127.7	96.0	84.5
Jan. 31....	73.3	124.4	101.2	79.4
Jan. 24....	79.9	121.9	106.4	89.2
Jan. 17....	75.0	124.0	108.5	90.2
Jan. 10....	59.0	115.9	111.3	86.9
Jan. 3....	18.5	76.7	87.5	76.7
Week ended	**1941**	**1940**	**1939**	**1938**
Dec. 27....	24.6	81.3	89.4	75.2
Dec. 20....	65.9	125.4	117.7	92.9
Dec. 13....	96.0	125.6	118.4	102.9
Dec. 6....	90.2	124.8	115.5	100.7

†Canadian trucks and automobiles and United States trucks, since Feb. 21.

Freight Car Loadings

(1000 Cars)

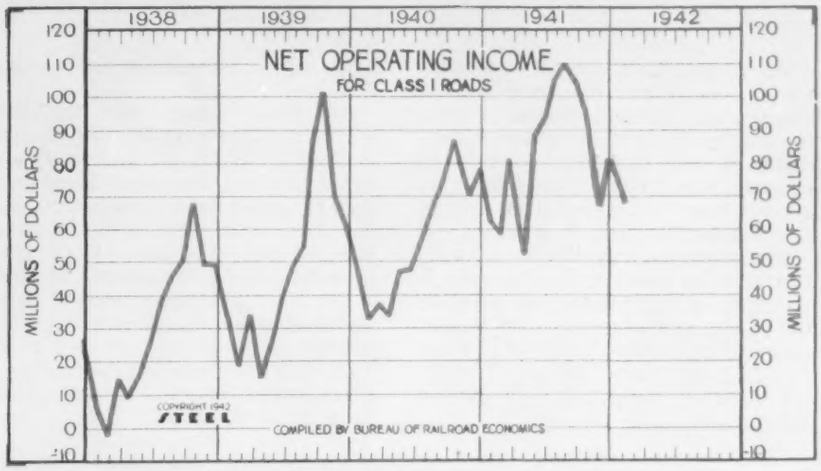
Week ended	1942	1941	1940	1939
Mar. 21.....	797	769	620	605
Mar. 14.....	799	759	619	595
Mar. 7.....	771	742	621	592
Feb. 28.....	781	757	634	599
Feb. 21.....	775	678	595	561
Feb. 14.....	783	721	608	580
Feb. 7.....	784	710	627	580
Jan. 31.....	816	714	657	577
Jan. 24.....	818	711	649	594
Jan. 17.....	811	703	646	590
Jan. 10.....	737	712	668	587
Jan. 3.....	674	614	592	581
Week ended	**1941**	**1940**	**1939**	**1938**
Dec. 27.....	607	545	550	500
Dec. 20.....	799	700	655	574

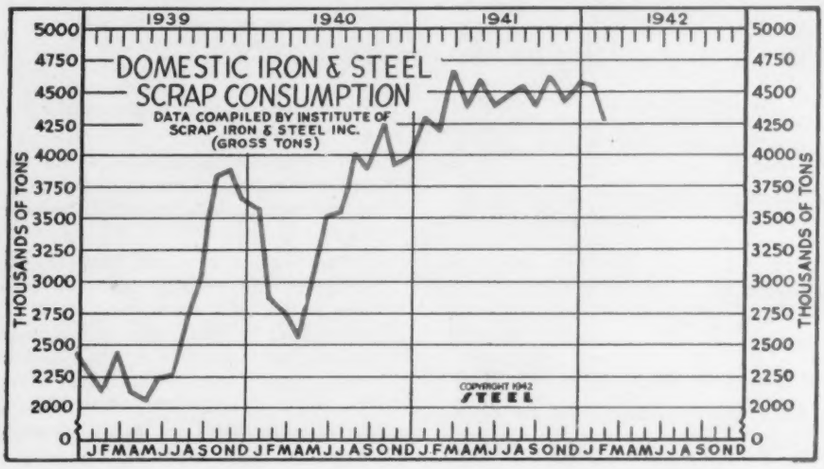


Class I Railroads
Net Operating Income
(Unit: $1,000,000)

	1942	1941	1940	1939
Jan.	$68.97	$62.02	$46.01	$32.95
Feb.	.....	58.48	32.86	18.64
Mar.	.....	80.63	37.03	34.38
April	.....	52.57	34.12	15.32
May	.....	88.63	47.41	25.17
June	.....	93.26	48.09	39.17
July	.....	106.31	57.73	49.00
Aug.	.....	111.32	66.53	54.57
Sept.	.....	104.07	74.72	86.53
Oct.	.....	93.66	87.64	101.72
Nov.	.....	68.76	72.00	70.41
Dec.	.....	80.55	78.79	60.95
Average	.....	$83.29	$56.84	$49.02

*Indicates deficit.



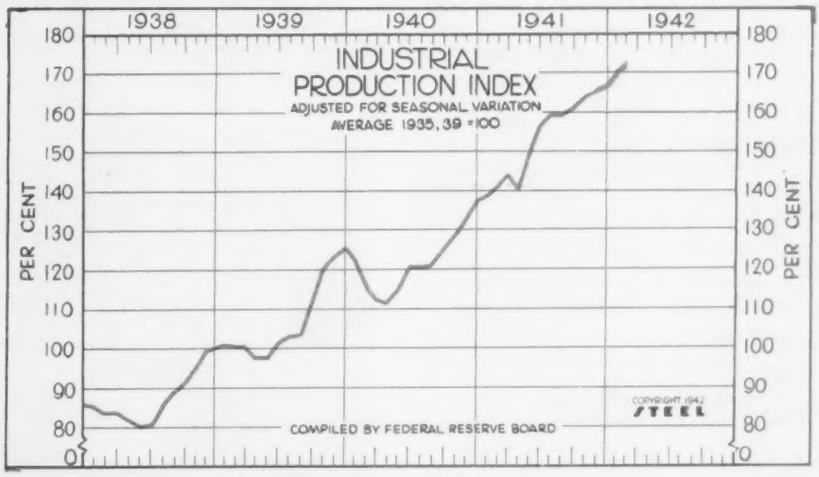

1939
1940
1941
1942
DOMESTIC IRON & STEEL
SCRAP CONSUMPTION
DATA COMPILED BY INSTITUTE OF
SCRAP IRON & STEEL INC.
(GROSS TONS)
THOUSANDS OF TONS
COPYRIGHT 1942 STEEL
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

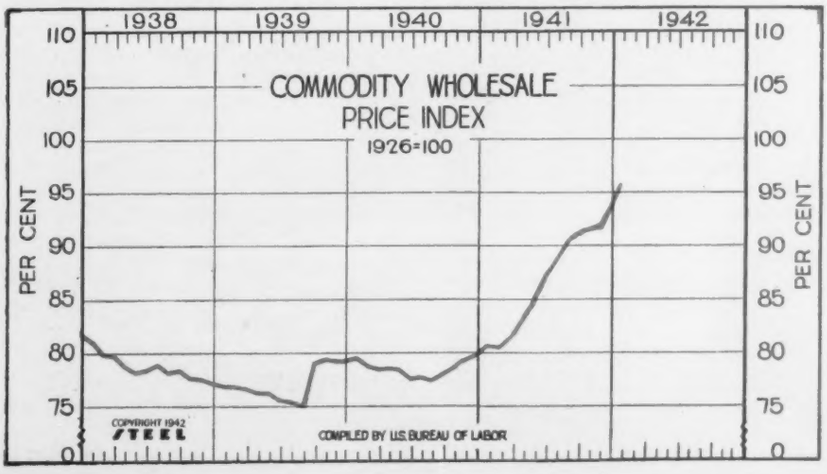
Iron and Steel
Scrap Consumption
(Gross Tons)

	1942	1941	1940	1939
		(000 omitted)		
Jan.	4,590	4,278	3,581	2,257
Feb.	4,276	4,172	2,812	2,124
Mar.	.....	4,662	2,728	2,419
Apr.	.....	4,406	2,548	2,114
May	.....	4,609	3,061	2,079
June	.....	4,406	3,482	2,221
July	.....	4,415	3,526	2,247
Aug.	.....	4,518	3,968	2,675
Sept.	.....	4,392	3,876	3,018
Oct.	.....	4,649	4,233	3,809
Nov.	.....	4,482	3,922	3,858
Dec.	.....	4,634	3,950	3,613
Total	.....	53,623	41,687	32,434
Mo. Av.	.....	.....	3,474	2,703

Industrial Production
Federal Reserve Board's Index
(1935-39 = 100)

	1942	1941	1940	1939	1938
Jan.	171	139	122	102	86
Feb.	173	141	116	101	84
March	...	143	112	101	84
April	...	140	111	97	82
May	...	150	115	97	80
June	...	157	121	102	81
July	...	160	121	104	86
Aug.	...	160	121	104	90
Oct.	....	163	129	121	95
Nov.	...	168	133	124	100
Dec.	...	167	138	126	101
Year Ave	....	154	122	108	88





All Commodity
Wholesale Price Index
U. S. Bureau of Labor
(1926 = 100)

	1942	1941	1940	1939	1938
Jan.	96.0	80.8	79.4	76.9	80.9
Feb.	....	80.6	78.7	76.9	79.8
March	....	81.5	78.4	76.7	79.7
April	....	83.2	78.6	76.2	78.7
May	....	84.9	78.4	76.2	78.1
June	....	87.1	77.5	75.6	78.3
July	....	88.8	77.7	75.4	78.8
Aug.	....	90.3	77.4	75.0	78.1
Sept.	....	91.8	78.0	79.1	78.3
Oct.	....	92.4	78.7	79.4	77.6
Nov.	....	92.5	79.6	79.2	77.5
Dec.	....	93.6	80.0	79.2	77.0
Ave.	....	87.3	78.5	77.1	78.6

AS EVERYONE knows, our supply of raw rubber has been cut off since Dec. 8, 1941, which means that every piece of industrial equipment of which rubber is a part must be conserved to the utmost to spread our thin supply as far as possible in the days to come.

This obviously applies to *all* rubber now in use. It is not only a patriotic obligation—*it is a must* for rubber plays a vital part in our nation's productive facilities. With no raw rubber available or in sight, *we have no choice* but to conserve all rubber to the utmost.

SAVE YOUR RUBBER

for you get no more

From here on in, new rubber items are going to be impossible or at least extremely difficult to get. So let's be realistic and take all means possible to get every bit of life from our rubber goods. Here is told how you can do just that

LET'S FACE IT . . .

There is no adequate source of rubber in sight.

Yet rubber is indispensable in much industrial equipment for producing war goods and civilian necessities.

That means it is not only sound economy but your patriotic obligation to see to it that every piece of equipment in your plant containing rubber is treated with the utmost care. Every man in the plant from the big boss to the office boy should know and follow the rules outlined here.

The things that cut the life of natural rubber are:

—The ultraviolet rays from direct sunlight

—Oil, gasoline and grease

—Abrasion

—Mechancal strains such as from heavy overloads

—Excessive heat or cold

—Constant bending and flexing

—Constant tension

—Continued exposure to water.

Here are some specific recommendations to help you get longer life from your rubber mechanical equipment as abstracted from a recent article in *Factory Management and Maintenance* by William S. Richardson, general manager, Industrial Products Division, the B. F. Goodrich Co., Akron, O.:

Water hose should not be bent, kinked, dragged over rough surfaces. Drain water from hose when not in use. Avoid working pressures higher than manufacturer's recommendation. Wind the hose on a reel when it is not in use. Store in a protected place away from sun and weather. Arrange all connections so hose hangs down to avoid bending or placing hose under tension at the connection.

Air Hose: Buy only the best grade available, with tube recommended to resist oil and heat, and cover to resist abrasion. Keep heat and oil exposure to minimum. Select hose with firm body to resist kinking and cracking. Keep compressers and after-coolers in good repair. Do not allow hose to catch or be dragged on equipment. When not in use, store in cool, dry place. Use high-pressure couplings having clamps that fasten to the shank as well as the hose.

Steam Hose: Use hose only at recommended maximum temperatures and corresponding steam pressures. Remember, a small-diameter hose will withstand more pressure than a large-diameter hose with the same number of plies. Use shortest practical length. Hose with one end open will withstand higher pressure than when both ends are closed. Guard against clogging or plugging of hose. Avoid superheated steam as it is more damaging to hose than saturated steam. Prevent alternate freezing and heating. Avoid flexing and bending. Use hose with extra cover thickness if subject to excessive abrasion. Be sure hose is especially designed for the particular service for which it is employed. Remember to leave one end of hose open when steam pressure is turned off as quick condensation may cause tube to pull away from carcass.

Be sure couplings are suitable for the pressures involved. Use couplings that can be retightened. Avoid exposure to excessive heat. When used for wash-up service where hose is exposed to fats, grease and oil, be sure outside cover is washed daily. Drain hot water from hose after using.

Fire Hose: Buy hose with closely woven jacket as this type wears longer and provides fuller protection from abrasion. Buy hose made with flat cure since it folds naturally and places no strain on hose tube when racked or coiled. When storing in racks, use as few folds as possible and change position of folds periodically to relieve strain on rubber at those points. Dry hose after use to avoid mildew. Remove new hose from packing cases immediately and loosen coils to relieve mechanical strains. Run water through unused hose periodically to retard oxidation. Drain and dry thoroughly thereafter. Clean hose before storing if exposed to oil or grease in service. Be sure to remove gasoline thoroughly as fumes can loosen tube from cotton jacket.

Check standpipe valve to be sure no leakage occurs into hose. Protect jackets from contact with acids. If such contact occurs, clean thoroughly with 5 per cent solution of washing soda, followed by a water rinse.

Hose Couplings: Be sure all burrs or sharp points from stem of coupling or nipple are removed. Coat inside of hose with soap solution or rubber cement before applying coupling. Never use oil or grease. Do not let cement dry before inserting shank of coupling. Be sure to use proper size stem; never cut away a portion of the tube to make it fit stem.

Cut hose squarely to allow proper seating. Wherever possible, use hose with capped end or apply several successive coats of rubber cement to the exposed fabric to eliminate wicking.

Force coupling into hose evenly —never drive with a hammer or mallet. Use proper size clamp al-

ways, and draw them up tightly. To couple wire-wound hose, turn wire in at right angles so it follows the hose and can be clamped down securely. Be sure hose is hung or suspended so coupling does not cause strain on hose.

Tires: While solid rubber tires will withstand harder usage than pneumatic tires, they are vulnerable to certain abuses. Wet rubber cuts much easier than dry rubber. Therefore special care should be taken to avoid curbs, rails and other obstructions when tires are wet. Overloading solid tires is extremely harmful. Avoid oil and grease; be sure floor-washing solution does not contain oil.

Over or under-inflation of pneumatic tires cuts their life, so maintain recommended air pressures at all times. Check air pressure after a few miles of service whenever a tire is changed. Shift tires from wheel to wheel every 5000 miles or more often. Watch abrasion—that means don't turn corners at high speed; jam on brakes; run with misaligned wheels; drive fast on hot, dry roads. Always start gently, avoid curbs, check tires immediately if car or truck steers queerly.

Conveyor Belts: In a rubber conveyor belt, the cotton fabric supplies all the structural strength and so does all the work in supporting and pulling the load. The rubber supplies no structural strength but affords the protection needed to resist abrasive wear, cutting blows, rot and corrosion. Negligible wear occurs when the correct conveyor belt is used along a straightaway and when the idlers are in good condition and properly spaced. Principal wear occurs at loading point. An ideal chute discharges the material upon the belt at nearly the same speed and in the same direction as the belt travels.

An effective measure to prevent lumps falling against the rubber surface is to cut a V-shaped notch in the lip of the chute to allow fines to drop on the belt first, thereby cushioning the fall of the heavier material.

Skirt boards will cause excessive wear if allowed to contact the belt at any time. They should always be set so space between board and belt increases in the direction of belt travel, thus preventing pieces from becoming wedged between belt and board to gouge the belt.

In cold weather watch that water does not freeze the belt to the pulleys as starting up the conveyor then can tear the rubber away from the belt. Always check the complete system before starting a belt which may be frozen to the pulleys.

Moisture that is allowed to saturate the belt will cause rot and mildew. Acid can do equal or more serious harm. Belts under moist conditions should be given a mildew treatment. Watch belt fasteners to be sure they do not cause tears or rips. Be on the lookout continuously for small injuries and make temporary repairs promptly until permanent repair such as vulcanizing can be accomplished.

V-belts: When applying belts, see that the sheaves are lined up, that sheave grooves are clean and free from harmful burrs and not unduly worn. Keep reasonable tension on belt. Do not force belt into groove, slacken take-up sufficiently first.

Belts in operation should be checked for alignment periodically. Keep belts and sheaves free from oil and grease. Adjust the takeup tension frequently. Always remove tools, bars and other materials from points where they may fall into drive. Guard against overloading the drive for any appreciable period of time. Protect belts from direct sunlight.

Clothing: Never store folded or under pressure. Hang up all garments and keep free from pressure. Do not expose to sunlight or excessive heat. Before storing any rubber wearing apparel, clean it thoroughly to remove all oil, grease or paint.

Mats: Rubber mats are essential for safety around much equipment. Unpack new mats as soon as received to avoid permanent set. Never force mats into place. Always trim if necessary. Be sure mat lies flat and that floor is clean and as smooth as possible. Avoid placing mats close to steam pipes or excessive heat. Be sure doors do not drag on mats.

Clean regularly with broom or brush and mop with clean water. Avoid cleaning solutions unless known to be harmless. If lime in hard water deposits a coating, scrub with soap and water preceded by a mild scouring powder.

When removing mats, avoid sharp bending. When cleaning, do not hang mats over sharp edges or hot radiators or pipes. Avoid outside exposure, protecting against sunlight, heat, gasoline, oil, chemicals and food products, which should be removed immediately by thorough cleaning if accidentally deposited on the mat.

Keep floor under mats dry. Turn mat over until dry whenever it gets wet. Do not roll trucks or pull heavy furniture or other objects over mats.

Tank Linings: Rubber linings are essential in much processing equipment including pickling and cleaning tanks of various types.

(*Please turn to Page* 86)

One Way To "Spread" a Girder

ONE OF the newest "wrinkles" in welding is clearly shown in the accompanying illustration—that of inserting a web between portions of a split H-beam to obtain a deeper girder. Here the beam, 12½ inches deep with 15½-inch flanges and ⅞-inch web, has been split and a 7/16-inch by 54-inch plate is being inserted to make this 35-foot girder 5 feet 7 inches deep. A Lincoln Electric Tornado automatic welding head mounted on a post is being used for the work. The head is lowered into working position by a rack arrangement, and filler wire is fed over top of head from a reel into the arc

Write by WIRE

- **to prevent misunderstandings**
- **to avoid interrupting recipient**
- **to provide a written record**
- **to fix responsibility**

HOW MUCH does the spoken word cost your business every year? The loss accruing from mistaken orders and the resulting confusion cannot even be estimated. The similarity of words is a boon to poets but a bane to business. When spoken, the sentence, "Tell him the amount is reduced," is very similar to "Tell him the account is refused." In the same manner "Blue jobs are slowing up line" could be understood as "New jobs are showing up fine," Many other phrases are easily garbled merely by misunderstanding a single word. In any of these instances, whether spoken to an assistant, to a group, or entrusted to any device which records or transmits the human voice, such phrases may easily result in costly mistakes or in valuable time wasted in further explanation.

It is the elimination of these mistakes and their waste of time and money that is influencing many industrial plants to utilize "writing by wire." Telescribing substitutes the security of the written message for the uncertainty of spoken orders.

There are many messages that should be written to avoid any possibility of error. By installing telescribing equipment from office to various portions of a plant, it is possible to transmit production schedules and schedule changes to every key point in the production process or assembly line instantly and with no possibility of misunderstanding or confusion. Shipping orders can be transmitted to the loading platform or shipping department instantly.

Similarly, requisitions for materials and parts needed for various departments can be sent to stock rooms; a record of materials sent from receiving department to production and stock control points can be made; information regarding production orders enables parts in production to be located quickly, regardless of what part of the plant they may be in; laboratory analyses of materials and products can be transmitted to control departments; advice from inspection and test departments can be transmitted to any portion of the assembly line or to any production department.

In transmitting messages, it is possible to send sketches showing dimensions, tolerances and other points which would be difficult to explain verbally. All this is done with no possibility of misunderstanding by the recipient since the message is in permanent written form as it is received.

The advantage of a permanent written record cannot be estimated. It at once eliminates all possibility of buck-passing and alibis as it definitely fixes responsibility either on the sender or recipient. Too, the written record is instantly available whenever it is needed for checking back.

Saves Time: To use a telescribing system such as the TelAutograph telescriber, only one operator—the sender—is required instead of two as there need be no recipient at the other end of the line since the message is recorded automatically. Also, since a message can be transmitted simultaneously to as many points as desired, it is not necessary for the sender to get in touch with various points in succession to repeat the message to them. The system provides 24-hour service at all points without attendants. It assures getting messages to their destination. Too, it is not easy to overlook a written message on the record.

The noise problem is particularly important in verbal transmissions in such plants as those doing press work and similar operations, but the telescribing system is unaffected by even the worst noise conditions.

A telescribing system relieves the

TYPICAL TELESCRIBING SYSTEMS

Handling Sales Orders and Production. System Connects—

—Sales order department
—Credit department
—Warehouse
—Production planning and scheduling department
—Manufacturing department 1
—Manufacturing department 2
—Etc.

To Handle Incoming Materials and Parts. System Connects—

—Receiving department
—Inspection and testing department
—Traffic department
—Purchasing department
—Storeroom
—Beginning of production line

By S. S. DEWSON
TelAutograph Co.
405 Fidelity Building
Cleveland

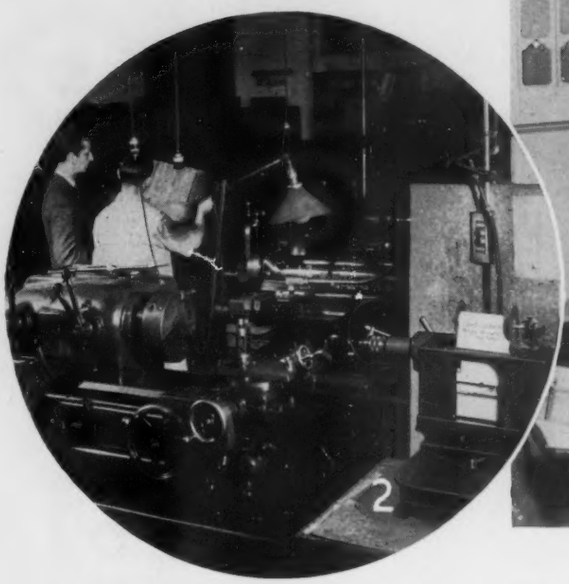


Fig. 1—Manufacturing department foremen are kept informed on jobs ahead, so materials and machine setups can be prepared in advance, speeding production. Fig. 2—If a job is slowed down by a machine breakdown, the department foreman is told of another job which can be done while the repair is being made, maintenance men can be summoned, repair parts requisitioned on the telescriber. Fig. 3—Production planning and scheduling department is notified of jobs by sales order department. Schedule man fits job into schedule, instantly informs all departments concerned in writing. Likewise, changes in quantities, specifications, delivery dates and the like are instantly telescribed to the department involved. Fig. 4—Stock Running Low: Stockroom and warehouse are in touch with all manufacturing departments so rate of production can be controlled to keep adequate stock reserves at all times, preventing shortages of stocked items.

Fig. 5—Packers Ready: Shipping department is notified in advance so shipping cases, packing and labeling materials, trucks and freight cars can be ready by the time the finished products arrive. Changes in shipping dates or routings are handled instantly

Fig. 6—Progress Reports: Order clerk can get quick okay on delivery dates, can check with production planning and scheduling to give prospective delivery dates, can keep in touch with production through all the manufacturing steps so he can answer inquiries as to progress of customer's jobs

switchboard load since the messages are transmitted over separate lines. Similarly, it is easy to locate anyone in the office or shop merely by sending a message to all stations. It is evident such quick convenient multiple communication saves manpower as it eliminates the need for messengers, stock chasers and others, who can then be assigned to productive jobs.

Why Kill Your Production Man? Today when every production man is almost driven frantic by demands on his time, a telescribing system can be of immense advantage to him since it eliminates constant interruptions from his work to take messages. In any plant, about 90 per cent of the messages to be transmitted are routine and could be received and acted upon any time within a few hours at the other end. With a TelAutograph system, all routine messages are recorded automatically at the receivers without requiring the attention of anyone.

At the same time, provision is made for the 10 per cent of the messages which require immediate action. A signal in the form of a bell, buzzer or light is actuated to indicate that a message is being received that requires immediate attention. Such a system automatically relieves the production man of 90 per cent of the interruptions to receive messages. This allows him to concentrate on his job, to organize his work and to operate much more effectively, to say nothing of eliminating the high con-

Fig. 7—Typical steel plant telescribing station—TelAutograph equipment at Jones & Laughlin Steel Corp.'s Pittsburgh plant

sumption of nervous energy required to concentrate on a job when one is being interrupted at frequent intervals.

What Is the TelAutograph System: As shown in accompanying illustrations, the TelAutograph is a machine which transmits script automatically as it is written. The sender holds a pencil-like stylus with which he writes on a plate. No mark is left on the plate, but above the plate his message is written out automatically, and simultaneously it is written at the various receiving stations. By means of keys, push buttons or other auxiliary control devices, the transmitter can be connected to any one or any combination of receiving stations desired. The transmitter and receiver can be incorporated into a single unit called a transceiver.

Principle of Operation: Movement of the scriber by the operator merely operates the arms of two rheostats or variable resistance units which are set at right angles to each other.

This varies the voltage applied to two meter elements carrying the pen so that the variations in resistance are translated into voltage variations, which in turn are translated into pen motions. In this manner the pen follows exactly the path of the scriber. The pen writes only when the scriber touches the plate, thus controlling continuity of the line drawn just as in ordinary writing.

Both transmitter and receiver units as well as combinations of the two have been developed to meet a wide range of requirements. The automatic winder type winds the messages on a roll to provide a permanent record. In those instances where it is desired to tear the message off from the strip to carry it to the files for looking up material, to the stockroom for pulling out parts or to deliver it to the person to whom it is addressed, a tear-off type is used. Instruments with an upright attachment are also available which show at a glance the last 8 or 10 inches of messages transmitted on the tape.

To operate it, the sender of the message merely writes in the usual manner, advancing the tape by pushing a button as it becomes necessary. As he advances the tape on his transmitter, the tape at the receiving stations also advances simultaneously. The operation is extremely simple. Anyone who can write can transmit messages. The sender need not be able to write particularly well. Those whose script may not be any too legible may prefer to print their messages.

Tangible Savings: Sending written messages with this system affords definite tangible savings by eliminating the need for many telephone extension lines; by cutting down the number of trunk lines required; by reducing telephone switchboard complexity and number of operators needed at the board.

Intangible Savings: The value of the personal time saved by eliminating the interruptions for receipt of messages cannot be estimated, nor the savings afforded by eliminating confusion and possible mistakes. A single mistake resulting from a verbal misunderstanding can and often does run into hundreds of dollars.

Above all, the savings in time of the production men by automatic receipt of the message is a factor which in itself would more than warrant the installation of the equipment in many instances.

Many installations of telescribing equipment are in use in the metal producing and metalworking industries. In automotive assembly plants they find an important application. The chief schedule clerk transmits assembly sequence production orders to the various subassembly lines and departments feeding the main assembly line. By means of the TelAutograph, it is possible for each automobile to be designed virtually for the owner. The customer may select a certain combination of body style, color, upholstery, tires and numerous accessories. All these selections must be co-ordinated so all the parts arrive at the final assembly line in sequence to fit into that particular car. Not only does the telescribe system permit the scheduling and feeding of proper parts to the assembly line at exactly the right time to complete the customer's order but greatly reduces chances for errors since all instructions are in writing.

Possibly the most important application for this type of communication system is in maintaining a tight-fisted control over all phases of production operations from receipt of raw materials to shipment of final product.

Traffic Control: A system with stations in the receiving department, testing department, purchasing department, production planning and scheduling office can do much to get incoming raw materials and parts into production departments or into storerooms without delay. Inspection and testing department immediately starts procedure for making necessary tests and telescribes okay or not okay with explanation to receiving and purchasing departments. Receiving and purchasing departments can then begin immediately to make necessary adjustments, direct disposition of the material at hand and order replacements. Prompt action makes settlement of damage claims easier. Messages telescribed to receiving department authorize transfer of materials to storerooms or manufacturing departments quicker, thereby releasing temporary floor space and handling equipment. This also saves heavy demurrage charges on material held on sidings in carload lots.

Storeroom clerk at once gets notice by telescriber that "rush items" have arrived and are ready for transfer to production department. If not needed immediately in production, production department can requisition material as and when needed by telescribing the message to stockroom, the message itself

The fate of a nation was riding that night

WE who carry on a great American name face the tasks ahead in a spirit of hope rather than sacrifice.

For we know from the example of Paul Revere that the reward of effort is not merely victory. It is a better way of life for many more of us. We have found that looking back on a glorious past brings calm confidence in the future.

To commemorate the 167th anniversary of Paul Revere's Ride, we have prepared a de luxe brochure of Longfellow's poem, with four beautiful colored prints by the famous illustrator, Joseph Boggs Beale, in the belief that many Americans will wish to own them.

We will send it to you on receipt of 25¢ in coin or a 25¢ Defense Stamp and the net proceeds will be divided equally between the Army and Navy relief societies as a contribution from patriotic Americans. Use the coupon below for convenience.

REPRODUCED ON THIS PAGE ARE THE FOUR 8¼" x 9" PRINTS YOU WILL RECEIVE IN FULL COLOR, READY TO FRAME.

Revere
COPPER AND BRASS INCORPORATED
NEW YORK, N. Y.
Founded by Paul Revere in 1801

Revere Copper and Brass Incorporated
222 Park Ave., New York, N. Y.
Enclosed is 25¢ in coin or a 25¢ Defense Stamp for my copy of the Paul Revere anniversary brochure.

Name.....

Address.....

City.....State.....

automatically serving as delivery instructions and as a signed requisition.

Constant written communication with the receiving and storage departments permits production, planning and manufacturing departments to know the minute needed materials are available. Foreman can requisition parts and materials as wanted, so is enabled to hold his floor inventory to a minimum.

Telescribed messages afford an automatic written record between receiving and purchasing departments and so speed checking up on deliveries. If purchasing department finds needed materials have not arrived, it can telescribe to the traffic department requesting the shipment be traced immediately.

Telescribed messages allow the receiving department to get information from the traffic department in writing as to disposition to be made of cars loaded with materials received but rejected by the testing department. Perfect co-ordination of departments at the receiving and shipping end of the plant thus is facilitated by this fast reliable transfer of written messages.

A typical example of an installation for traffic control of incoming and outgoing shipments is that at the steel mill of the Copperweld Steel Co., Warren, O. Here three transmitter-receivers are used, one each in the traffic department, shipping department and subshipping department. By means of keys, any station can telescribe to either or both of the other two. The traffic department receives information on incoming and outgoing shipments. The shipping department receives instructions from the traffic department on shipments and is enabled to check with the traffic department quickly as to disposal of incoming material. Sub-shipping department similarly is in direct contact with the main shipping department office as well as the traffic department. The second station is 450 feet from the first stataion, and the third station is 300 feet further along. Distances of course mean nothing in such a system since it is possible to locate the transceivers miles apart.

Such a system in the receiving end of the plant means shipping losses are held at a minimum since there are no unnecessary costs due to errors in shipment. Also the shipping department is constantly informed of orders and changes in orders, allowing movement of freight cars and trucks to be scheduled and loads to be planned scientifically. Such tight-fisted traffic coordination and control can afford significant saving in cars not loaded to minimum weight requirements.

Quality Control: While the most skillful laboratory technicians and the best testing equipment can not stop scrap losses, instant and accurate reports on tests from the laboratory back to manufacturing departments can hold such losses to a bare minimum. Telescribers linking laboratory to operating departments assure instant action since the reports are reproduced in writing in 1 or 100 departments simultaneously. Any deviation from standard can be instantly noted, work in process stopped, changes made to correct the difficulty—all with minimum delay. It is easy to see how this lowers salvaging costs, holds down "off standard" products or "seconds," eliminates delays and thereby keeps up quality, even at maximum production speeds.

Typical installation of such quality control is found at the East Side works of the American Rolling Mill Co. at Middletown, O. Here a 4-station system interconnects the open hearth melter shanty, the production department, the soaking pit building and the metallurgical laboratory. Each station can transmit to any one or combination of the others as well as receive from any other station. It has been found desirable here to have all stations connected in multiple so any message is telescribed to all other stations in the system. This layout has been found to provide speedier transmission of chemical analyses —especially preliminary tests sent to all departments concerned.

This quality control system allows the open hearth to tap the furnaces on time, thus saving a great amount of scrap as well as considerable confusion in scheduling heats. It also permits heats to be scheduled from the production department to the soaking pits and open hearth simultaneously.

A similar system for checking orders and for quality control is utilized at the Hamilton, O., plant of American Rolling Mill Co., where four stations interconnect the stockyard office, the hot metal scales, the chemical laboratory and the open hearth melter's office. The stockyard office transmits orders for hot metal shipment to the other stations. The hot metal scales department telescribes weight of hot metal shipments and time of departure. The chemical laboratory telescribes chemical analyses. The open hearth melter's office receives a record of all transactions between the other stations so it is able to know what is going on. This system has been found to conserve considerably the time of the open hearth melter since he no longer need walk to the stockyard office to record chemical analyses and hot metal shipment arrivals. Also, it enables him to plan his work more effectively at the open hearth.

Another installation of telescribing equipment for production and quality control is the six-station setup in a Warren, O., steel mill interconnecting the melt shop, melter's office, 29-inch rolling mill, chemical laboratory, plant superintendent and the production department. Means are provided whereby stations telescribe to the others either

Where There's a Will There Is a Way

FIFTY-SIX PIECES of scrap steel—gathered from departments of Union Steel Products Co., Albion, Mich., then welded, make up the above plating tank. Failure to obtain the needed tank, or materials necessary to fabricate it to keep war production rolling led the maintenance department to canvass the plant for scrap steel. Some of the pieces used are as small as 4 inches square

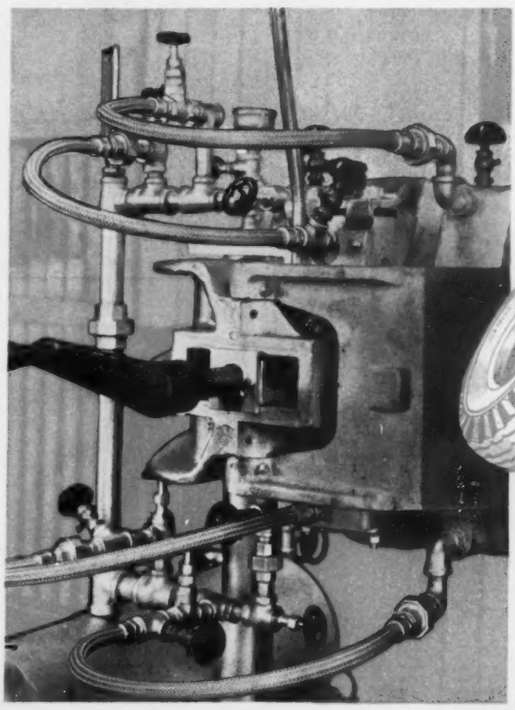
The RIGHT Flexible connector for countless "WAR" applications

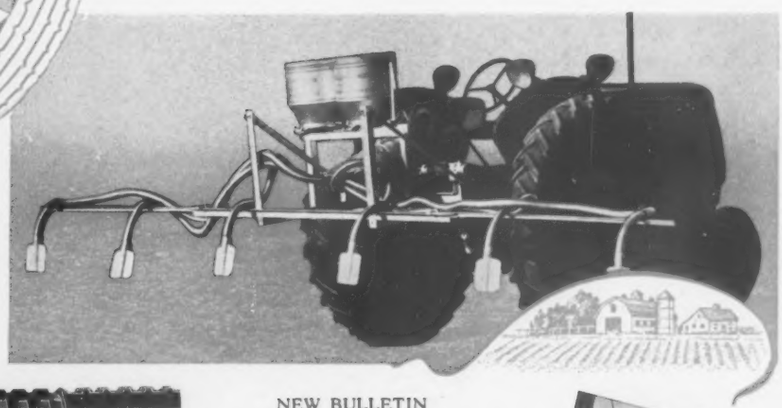
In addition to inherent flexibility, American Flexible Metal Hose and Tubing has that rare quality *flexibility of application* which makes inevitable its use in jobs where less adaptable flexible connectors cannot survive. Plane builders use it to protect aircraft radio sets from low tension static interference; in the form of parachute rip cord housing it guards the lives of our nation's pilots. Insecticides sprayed through flexible metal hose protect growing plants. Tire recapping machines are supplied with live steam.

And so it is—wherever moving parts of machinery require connectors to convey steam, water, lubricants; wherever gases, liquids, solvents must be carried safely without leakage, you will find American Flexible Metal Hose.

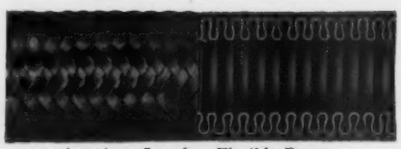
In thousands of such duties the products of AMERICAN are standing up . . . and speeding up, under twenty-four hour punishment. Whatever or wherever the job — you will find tough, tight, dependable American Metal Hose serving and saving.

SEE ASSEMBLIES ON NEXT PAGE





American Square-Locked Flexible Metal Tubing, cord packed.



American Seamless Flexible Bronze Tubing.

American Flexible Aluminum Shielding Conduit.

NEW BULLETIN

Contains full data and specifications on American Metal Hose aircraft products—flexible low tension shielding conduit and fittings—flexible aluminum and stainless steel tubing — ferrule attaching machines, etc.

If you are interested send for your copy of Bulletin A-48. For any use of American Flexible Metal Hose and Tubing we shall be glad to supply bulletins which give complete details.

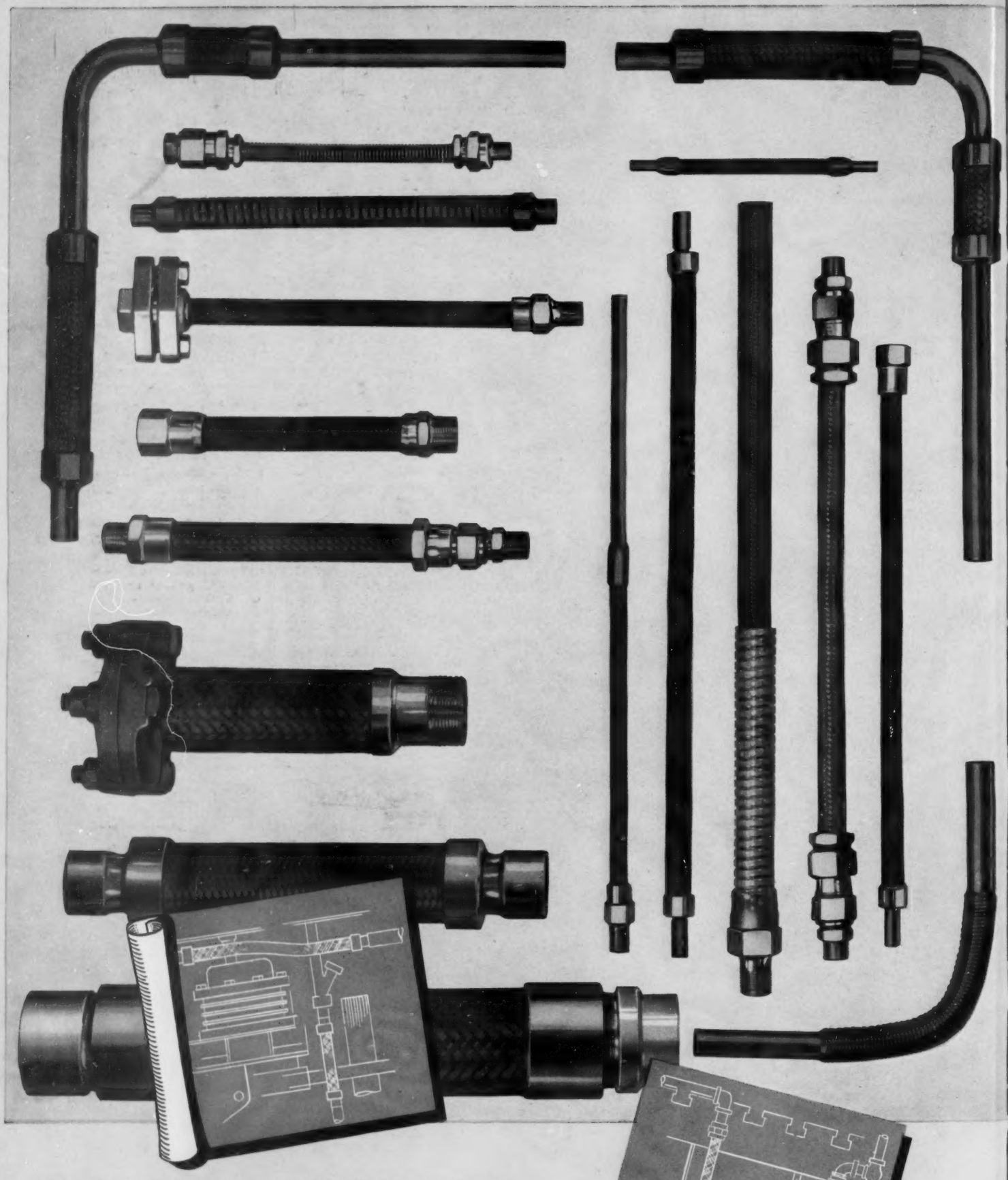
American Metal Hose

ANACONDA
From mine to consumer

AMERICAN METAL HOSE BRANCH of THE AMERICAN BRASS COMPANY

General Offices: Waterbury, Conn. • • *Subsidiary of Anaconda Copper Mining Company*

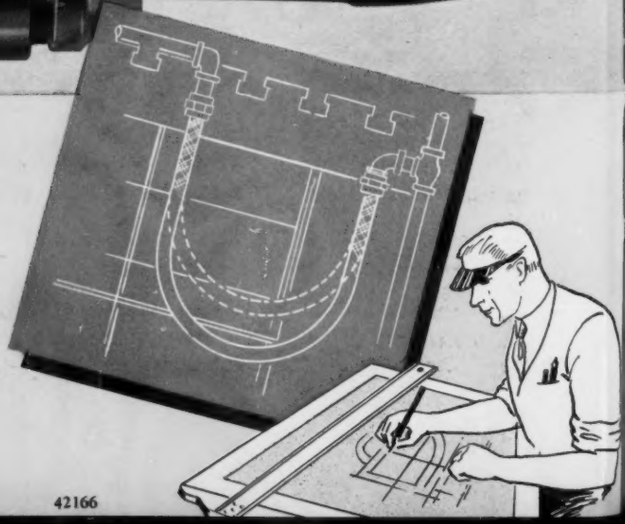
In Canada: Anaconda American Brass Ltd., New Toronto Ont.



PLAN *EARLY* FOR *FUTURE* PERFORMANCE

Machine designers . . product engineers . . the best time to plan for the use and benefit of American Metal Hose and Tubing is during the early stages of development.

The assemblies shown above have solved many problems of production, and increased the operating efficiency of products. They have reduced costs, decreased maintenance . . . and provided neat streamlined design. Send for Bulletin A-48 for the Aircraft Industry. Ask us also for specific recommendations or bulletins covering *any* use of American products.



AMERICAN METAL HOSE BRANCH of THE AMERICAN BRASS COMPANY

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42166

B COLD FINISHED STEEL

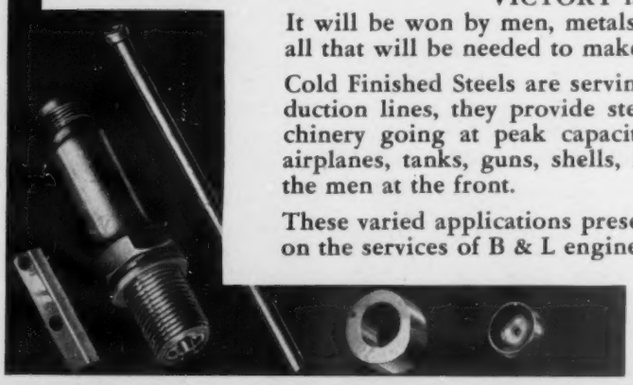
BACKS THE MEN AT THE FRONT

Quicken your production by the use of B&L Strain Tempered Bars

VICTORY is only a question of time . . . and just as certain as time. It will be won by men, metals and machines. Industry's big job is to supply quickly all that will be needed to make America *first* on sea, on land, and in the air.

Cold Finished Steels are serving the armed forces in two important ways: In the production lines, they provide steel shafting and fabricated parts to keep industrial machinery going at peak capacity . . . In the combat lines, they provide vital parts for airplanes, tanks, guns, shells, increasing the fire-power and the mechanized might of the men at the front.

These varied applications present many new problems to steel users who have first call on the services of B & L engineers.



COLD DRAWN BARS • SHAFTING • SCREW STOCK
ANNEALED BARS • WIDE FLATS • ALLOY STEELS

BLISS & LAUGHLIN, INC.

HARVEY, ILL. Sales Offices in All Principal Cities BUFFALO, N. Y.

in multiple or selectively as desired. Thus the chemical laboratory may telescribe simultaneously to the production department, the 29-inch mill and the melt shop or selectively to the production department, the superintendent's office, the 29-inch mill, the melter's office or the melt shop extension. It is easy to see what this close contact can mean in facilitating production and quality control.

Production Planning: One of the most useful applications of the telescribing system is in connection with production planning since it enables the production department to coordinate production schedules effectively even when a large number of production processing departments are involved and where final assembly lines may be long and extremely complicated. It takes only a few seconds to get action on production schedule changes to accommodate rush orders, order changes, cancellations, etc.

A typical system for production control would interconnect the sales order department, production planning and scheduling department, two or more manufacturing departments, stockroom, maintenance department and shipping department. Sales order department upon receipt of an order or change in order gets instant action by telescribing to the production planning and scheduling department, which notifies the various departments concerned, contacts the warehouse to see if stock is at hand, notifies shipping department in advance to have shipping cases and shipping facilities ready.

Similarly, any breakdown occurring in the production department is instantly telescribed to the maintenance department as well as to production planning and scheduling department so jobs can be rescheduled until the needed equipment is again available for production. Spare parts are requisitioned immediately by the same system.

Such a system frees the production men from the haunting fear that orders will be misunderstood and not communicated to all departments.

Written instructions involving specification changes, revisions in quantities, sketches of new parts, new delivery date and the like are flashed simultaneously to all departments concerned. Such close control enables production to be planned on a quick turnover basis, affords a means to stop underproduction, prevents overproduction and can minimize loss of labor or materials.

Typical of the more complicated telescribing systems for production control is that found at the plant of the plumbing manufacturer, the Kohler Co., Kohler, Wis. Here 18 stations are employed. Station No. 1 is brass planning. It has four keys, permitting it to telescribe selectively or collectively to the brass building, pottery, pottery packing or closet seats department. In turn each of these can telescribe back to the brass planning department. This forms a separate system of five stations.

Another system of 13 stations at the same plant enables the enamel and vitreous planning office to telescribe selectively or collectively to the north foundry, north closet room, enamel shop, south foundry, south closet room, crate nail department, truck foreman, and five other production departments. In turn, any one of these stations can telescribe back to the enamel and vitreous planning office since each station is a combination transmitter and receiver.

Selection of any one or any combination of the 12 stations at the enamel and vitreous planning station is made possible by selector keys.

A similar installation for production control is employed at the Ft. Wayne, Ind., works of General Electric Co., where small motors are manufactured. Here 11 stations are employed to interconnect the planning office with 10 different production departments.

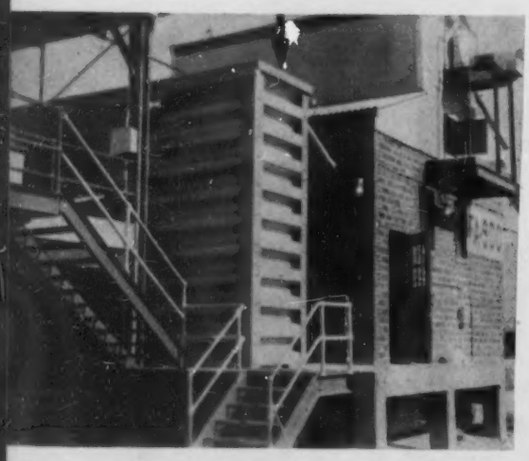
Seeks Approval on Practice Change

With approval of the standing committee for recommendation R57-32 "Wrought-Iron and Wrought-Steel Pipe, Valves and Fittings," the Division of Simplified Practice, National Bureau of Standards, Washington, recently submitted the proposed revision of the recommendation to all interests for consideration and acceptance.

Promulgated originally in 1926, the recommendation was revised in 1932 with the elimination from the practice of the 3½-inch pipe in the double extra-strong weight. Current revision consists of the elimination of the 3½-inch pipe in the standard and extra-strong weights.

Proposed by the Manufacturers Standardization Society of the valve and fittings industry, the current change is based on a sampling which showed a relatively small demand for 3½-inch valves and fittings. Thus, in view of the need for conservation during the present war the society suggests the elimination of the 3½-inch pipe would be desirable.

Mimeographed copies of the proposed move may be obtained without charge from the Division of Simplified Practice.



DESTRUCTION of an untold number of airplanes on the ground at Pearl Harbor has led to suggestions as to a number of measures

METAL "SANDBAGS"

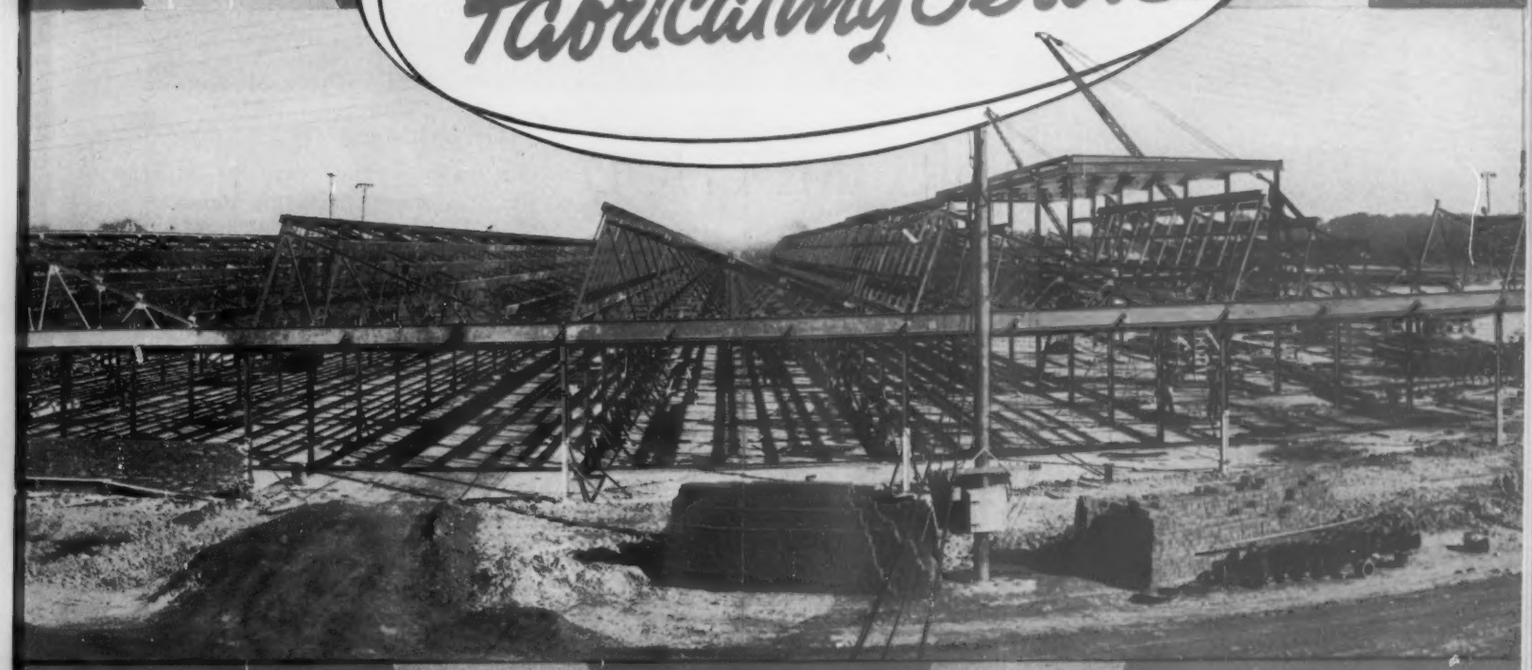
. . . . make "splinterproof" walls

to provide protection against bomb splinters. One such suggestion advanced by the Armco Drainage Products Association and the Armco International Corp., both of Middletown, O., is the use of bin-type metal retaining walls arranged in various layouts. These walls, set vertically and to any height required, not only give ample protection against bomb splinters, but they have the advantage of occupying a minimum of valuable space; they are quickly installed by unskilled labor; they can be dismantled and stored in a minimum of space. They are literally "metal sandbags" but are much more permanent.

Metal barricade walls are not entirely a new idea. Hundreds of them have been installed at ordnance plants in this country to isolate any possible blasts and to protect adjoining buildings. See illustration.

Detail drawings and photographs showing recommended constructions for such barricade walls may be obtained by addressing the Armco Drainage Products Association or any of its member companies.

When the job calls for SPEED and CAPACITY ...use this new *Fabricating Service*



EVERY foot of space — every man and machine must be fully used and closely coordinated if we are to quickly achieve the goal before us. We must expand with speed.

Four V Structural Steel Companies are organized to help speed this program of industrial expansion through their combined resources of time, men and equipment. They have capacity to produce thousands of tons of fabricated structural steel per month.

Thus Four V offers another needed source for the fabrication of mass tonnage under the supervision of a single engineering and production staff, and with responsibility centered in one management to secure top efficiency.

Each associate in the Four V Structural Steel Companies contributes a background of broad experience and proved ability, which in combination makes the organization outstanding in its capabilities. Many thousands of tons of structural steel have rolled from their shops into the rapidly expanding construction program.

If you have a problem of structural steel fabrication, the Four V organization is ready to help you solve it . . . quickly and efficiently. Wire, phone or write today.

Four V STRUCTURAL 4 STEEL COMPANIES

37 W. Van Buren Street — CHICAGO, ILLINOIS

Clinton Bridge Works, Clinton, Iowa

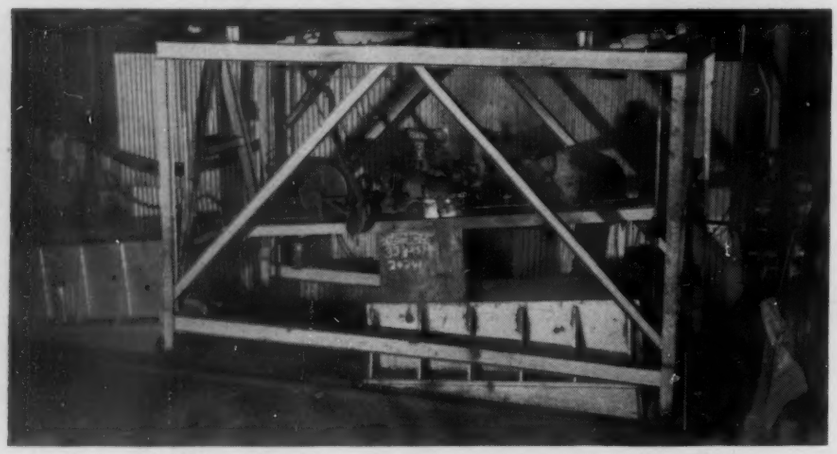
Duffin Iron Company, Chicago, Illinois

Gage Structural Steel Co., Chicago, Illinois

Midland Structural Steel Co., Cicero, Illinois

NEW CLADDING METHOD

.... lowers costs as much as 45 per cent, is extremely flexible, employs automatic carbon arc to seal blocks for rolling



These blocks, left, at top of page, consist of two slabs of stainless separated by a mixture and held between two heavy slabs of low-carbon steel. The bars which will seal the block have been tacked in place along the sides as shown here. Here block, right, top of page, is positioned in fixture which tilts it at correct angle to control flow of metal during the automatic carbon arc weld. Welding rig, immediately above, travels in frame on an inclined path. Automatic Electronic Tornado welding head travels up the joint as the weld is made, enabling the weld metal to be held in place and controlling its flow as it is deposited. Note two fixtures are provided for the work so one can be reloaded while other is being used. A closeup of the finished seal weld is shown directly below

JESSOP STEEL CO., Washington, Pa., is manufacturing stainless-clad steel by a new method which increases the availability of this important metal despite critical shortages—an important contribution for the time and cost-saving features. The method not only makes the advantages of stainless available for many important applications, but is said to save up to 45 per cent on material costs as well.

In making stainless-clad steel by the Jessop method, two slabs of stainless steel with a separating compound between them are inserted between two mild steel slabs. The stainless slabs are sealed in the mild steel slabs by means of bars which are first tack welded and then automatically finish welded all around.

The completed block is then rolled. This joins each stainless slab to its backing slab of mild steel and at the same time the block is rolled out into a comparatively thin sheet of large area.

The accompanying illustrations show the various operations in the automatic welding process prior to rolling. Use is made of the "Electronic Tornado" process of automatic carbon arc welding, equipment being suppled by Lincoln Electric Co., Cleveland.

This method is extremely advantageous in that furnace gases are excluded, and the components are held together with sufficient strength to withstand the terrific pressures developed during rolling. The stainless steel covering or cladding obviously guards against corrosion whereas the mild steel backings allow more economy. Thus, up to 45 per cent is claimed to be saved in material costs.

An important advantage is the extreme flexibility of the method for the clad material can be supplied to the purchaser's individual requirements so he obtains that cladding best suited to his particular corrosion-resistance problem.

Goal Ahead

Like every thinking American, we are all out for Victory—Victory at the earliest possible moment.

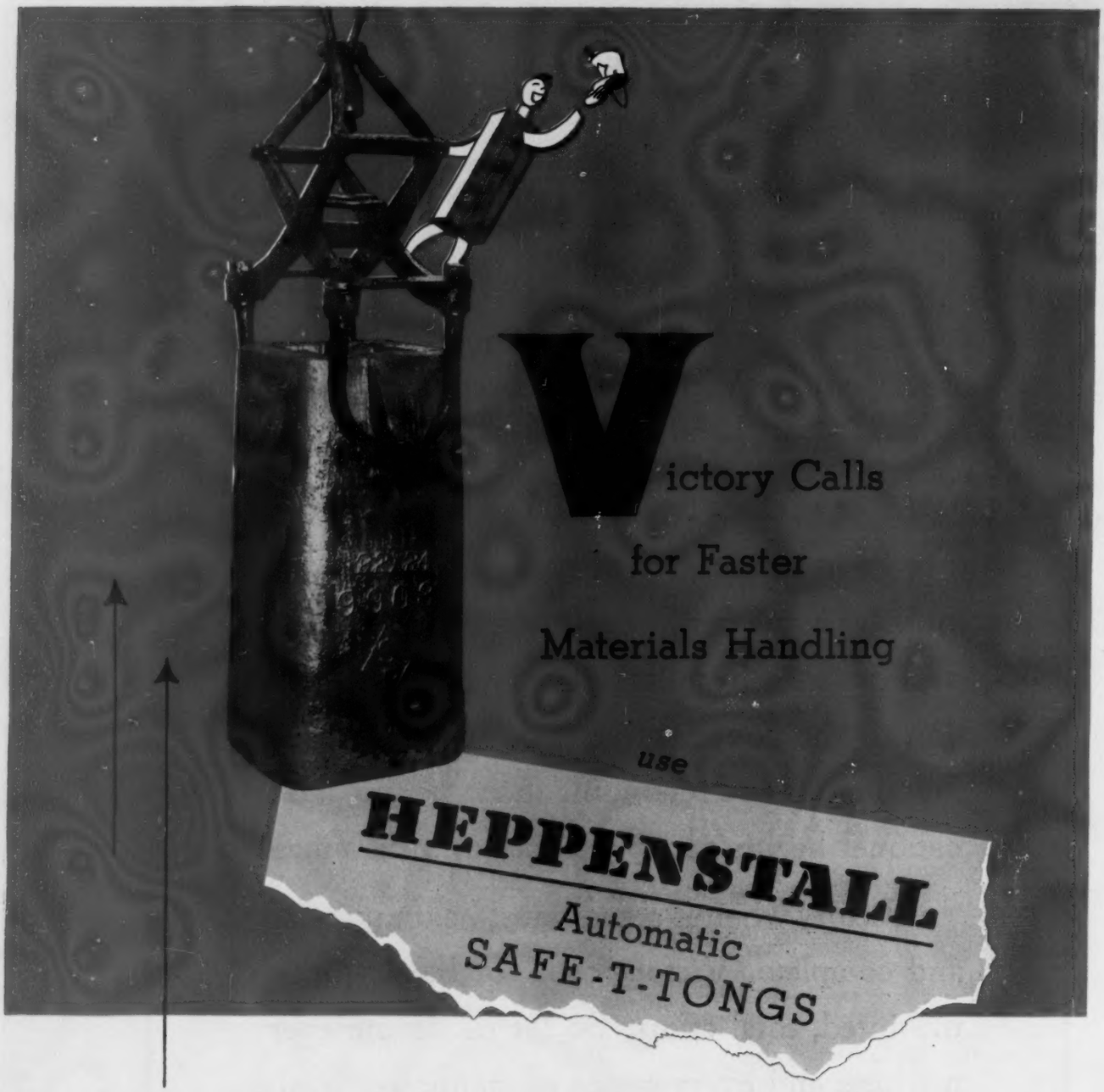
Most of the 41 years of Youngstown's history have been years of peace. Like you, we look forward confidently to that day when steel can turn from its terrible work of destruction to the constructive task of restoring the foundations and rebuilding the structure of our national health and prosperity and happiness.

Victory when it comes must be unqualified, and complete. Victory calls for hard work—unstinted, total effort. So let us devote every machine and every ounce of manpower to the winning of the war. That is American Industry's task for TODAY——not tomorrow, but NOW.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

YOUNGSTOWN, OHIO

25-31E



Don't let slow handling of materials by crane or hoist cut down your plant's capacity to produce for victory. Heppenstall Automatic Safe-T-Tongs add speed plus safety to this operation, because rigging of chains and slings—all other close work by ground men is eliminated. Heppenstall Automatic Safe-T-Tongs go through their entire cycle of pick-up, carry, and release swiftly and easily—economically, too, because they operate mechanically without depending on electricity or any other means of power.

And Heppenstall Automatic Safe-T-Tongs require no other manipulation than dropping them on the work. Crane men can operate them with only a few minutes instruction.

Heppenstall engineers will gladly cooperate in developing special tongs to solve your handling problems, no matter how unusual they happen to be. Save all-important time—add safety and economy to your operation. The benefits of Heppenstall Automatic Safe-T-Tongs are proven in thousands of applications from coast to coast. Write for free, new, 24 page Safe-T-Tong catalog. Address, Box S4, Heppenstall Company, 4620 Hatfield Street, Pittsburgh, Pennsylvania.

HEPPENSTALL QUALITY

Heppenstall Company

PITTSBURGH DETROIT BRIDGEPORT

Forging Fine Steels For More Than Fifty Years

CONVERSION OPPORTUNITIES

For Electroplaters

. . . . are revealed by list of typical present and suggested military applications of electroplated coatings compiled by W. Blum, National Bureau of Standards, and W. W. McCord, War Production Board

THE ATTACHED list was prepared in an effort to meet the needs of our military departments for electroplated coatings as far as possible by means of existing plating equipment and personnel. This list is by no means complete, and new uses of plating are likely to arise. Details of certain of these applications are not available, but if and when such methods are adopted, contracts will be made with appropriate plants. (from *The Monthly Review* of the Electroplater's Society, Springfield, Mass.)

It is a valuable reference for those electroplating shops not yet in production of war material, for it reveals the many opportunities that exist for conversion to war work.

Aeronautics

Engines—
- Chromium plating of engine parts
- Chromium or nickel plating of steel propeller blades
- Lead, silver and indium plating on bearings
- Nickel plating for fit of engine parts
- Copper plating before carburizing
- Tin plating before nitriding
- Lead plating on bronze bushings for "run-in"
- Nickel plated steel to replace nickel alloys for manifolds, etc.
- Nickel, iron or chromium plating on worn or undersized parts
- Nickel and chromium plating of aluminum parts or bodies

Fittings—
- Cadmium or zinc plating on brass and steel parts, especially in contact with aluminum
- Anodic oxidation of aluminum
- Anodic treatment of magnesium
- Chromium plating on brake drums

Attire and Personal Equipment

Clothing—
- Zinc, copper, black nickel, oxide coatings on steel buttons, buckles and insignia

Gas Masks—
- Black or brown finishes on steel parts

Canteens—
- Silver plated inside

Safety Razors—
- Silver plated

Communications

Radio—
- Zinc or cadmium plating of parts

Telephone—
- Zinc, cadmium, copper, nickel and chromium on parts
- Zinc plated steel wire

Housing—Barracks, Etc.

Hardware—
- Outside—zinc or cadmium on steel
- Inside—copper on steel

Plumbing Fixtures—
- Nickel and chromium on brass (hospital)

Illumination

Search Lights—
- Electroforming in copper or iron
- Plating surface with silver or rhodium
- Anodized aluminum

Landing Lights—
- Plated with silver

Flood Light Reflectors for Factories—
- Plated with silver
- Plated with chromium

Mirrors—
- Airplane rear vision. Nickel plus chromium plating on steel or brass
- Camp and wardroom mirrors
  - Glass—silvered plus copper plate
  - Sheet steel or brass—nickel plus chromium plating

Conduit and Outlet Boxes—
- Zinc plated

Marine Construction

Steel Fittings—
- Zinc plating

Welded Joints of Galvanized Steel Tanks—
- Zinc Plating (Spray or Brush)

Marine Propellors—
- Chromium or Nickel Plating

Diesel Engine Cylinder Liners—
- Chromium Plating

Medical Supplies

Surgical Instruments—
- Copper, nickel, chromium plating

Fracture Splints, Braces, etc.—
- Copper, nickel, chromium plating

Bowls and Pans—
- Nickel, chromium—preplated sheets

Mess Equipment

Tableware—
- Copper, nickel, chromium, and silver on steel tableware (RR-T-56)
- Same on mess trays

Cooking Utensils—
- Copper, nickel, chromium, and silver on steel pots and pans (Query—from preplated sheet?)

Buckets, Garbage Cans, etc.—
- Zinc, preplated sheets

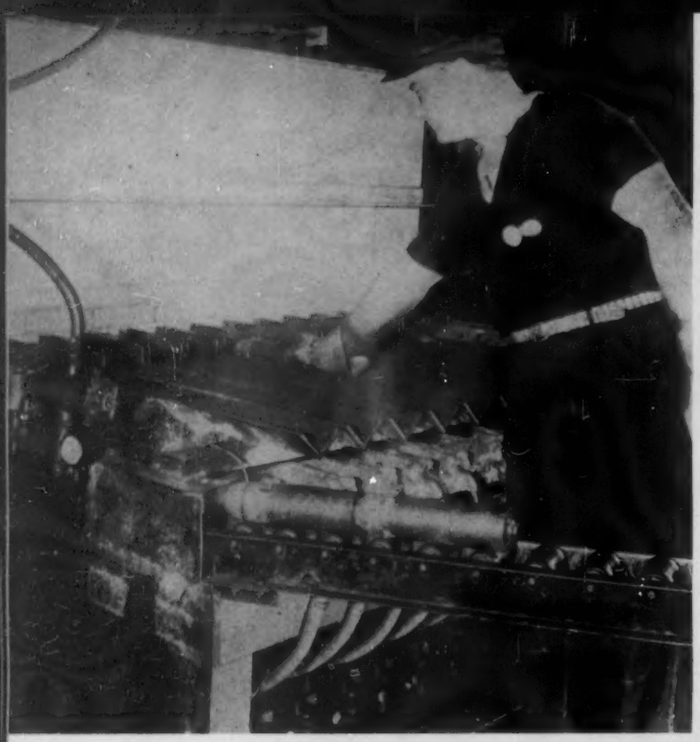
Field Ranges—
- Zinc plated sheet metal

Ordnance

Guns—
- Chromium plating interior of large-caliber gun barrels
- Chromium plating interior of small arms
- Chromium plating exterior of small guns
- Chromium plating rollers and circles for gun mounts
- Copper plating on undersized gun parts

Ammunition—
- Plating copper or zinc on steel cartridge cases
- Deposition of copper driving bands
- Cadmium or zinc plating of fuze parts
- Lead plating inside of underweight shell (Used in 1918)
- Sheet steel plated with copper, zinc or lead for lining ammunition shipping containers

Tanks—
- Brass plating of steel track for rubber adhesion



NEW ELECTRIC FURNACES

For Heat Treating

By C. L. IPSEN
Manager
Electric Heating Section
General Electric Co.
Schenectady, N. Y.

ELECTRIC FURNACES prior to World War I were small devices confined to laboratory use. But the demands of that war for speedy and accurate heat treatment resulted in the electric furnace's being developed into a production tool that quickly proved its usefulness for quality heat treatment. Furnaces of that time were of simple design and largely of the batch type. The direct-heat strip resistor of that day is, however, still the standard heat source of today's furnaces.

Around the original concept of the strip-resistor heat source, the modern electric furnace assumes many variations in design and construction. Continuous furnaces with accurate time as well as temperature control are now available in mesh-belt conveyor, plate conveyor, roller hearth, pusher, rotary hearth, monorail conveyor, and rotary-drum types to meet the widely varying demands of industry. Added to these are the many batch types such as box furnaces, car-bottom furnaces, elevator furnaces, bell furnaces, and pit furnaces in ratings up to 2000 kilowatts. And many of these furnaces are equipped with automatic materials-handling facilities.

Forced-convection furnaces have high-temperature fans installed directly in furnace chambers or in external chambers to recirculate air or protective gas through the charge to accelerate heating and to insure uniform temperatures throughout. Such units are used effectively to heat treat magnesium and aluminum aircraft parts and also are employed in the form of drawing furnaces, bell-type strip annealing furnaces, and as gas-carburizing furnaces.

Modern protective atmospheres that prevent oxidation and decarburization of parts during heat treatment no longer make it necessary to spend the time and money required to sand blast, pickle, machine and grind parts after heat treatment. Parts come from the furnace unimpaired.

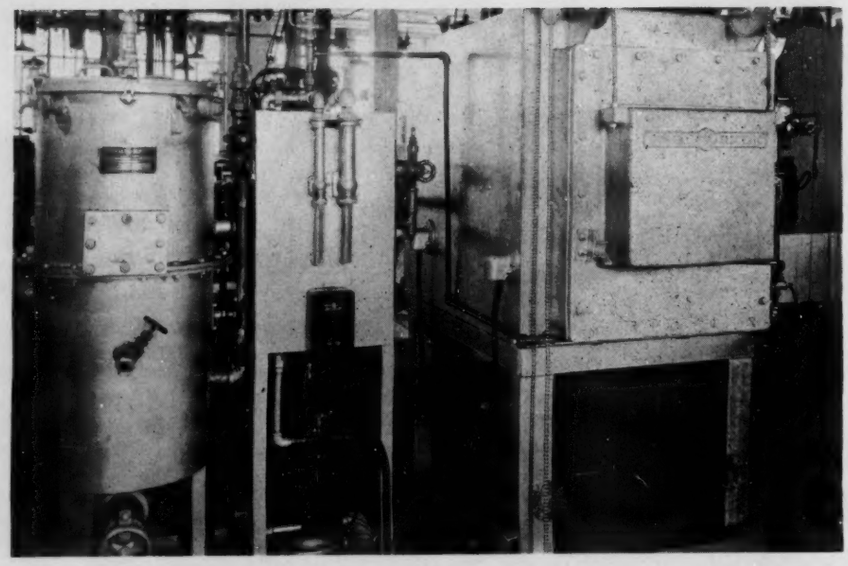


Fig. 1. (Top left)—Pusher-type furnace for heat treating shell bodies as seen from pusher end. Air cylinders operate mechanical pushers to feed 12 rows of nosed shell bodies automatically through furnace. Note conveyor in foreground delivering work to furnace

Fig. 2. (Immediately above)—Protective-atmosphere box type furnace rated 15 kilowatts. Inside loading dimensions are 12 inches wide, 27 long, 8 high. Left is 200-cubic-feet-per-hour combustion-type Drycolene atmosphere producer. Unit hardens steel without scaling or decarburization

More recent developments in the electric furnace field include new standard box-type furnaces with controlled atmosphere for heat treating steels not only without oxidation but also without decarburization, using the new Drycolene atmosphere. See Fig. 2. Each furnace has a high-velocity downward-projecting flame curtain located at the front of the furnace and across the door opening. This flame curtain operates when the furnace door is open, sealing the door opening against the admission of air. The four sizes include ratings up to 50 kilowatts.

Seven elevator furnaces of new design, each rated 1000 kilowatts, were installed recently for the heating of aluminum-alloy sheets. A typical charge consists of 36 sheets of aluminum alloy, each 20 x 6 feet. The sheets are suspended from a loading rack, both rack and charge being raised into the furnace by means of a high-speed hoist as shown in Fig. 3.

The charge is brought up to tem-

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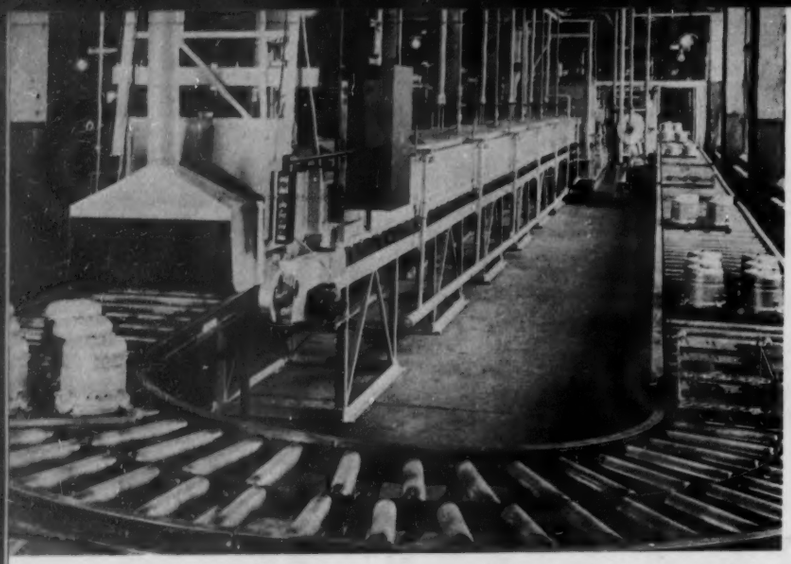

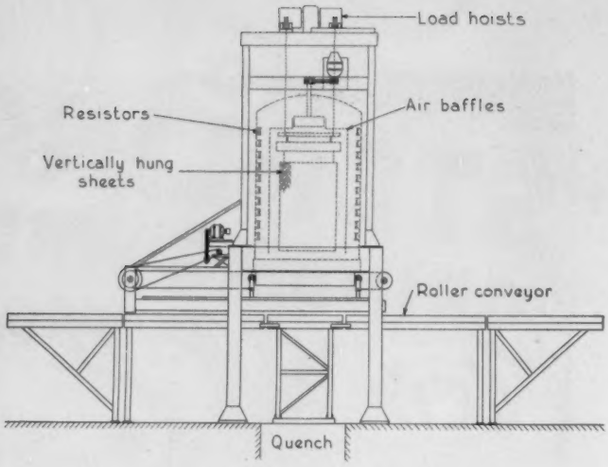

Fig. 3. (Right above)—Vertical drop furnace of air-recirculating type speeds much work in war production

Fig. 4. (Left)—Typical roller-hearth copper-brazing furnace with automatic charging and discharging mechanisms as seen from the discharge end. Door opening is 28 inches wide, 13 inches high; heating chamber, 17 1/3 feet long; cooling chamber, 69 feet long. Unit is rated 320 kilowatts

perature by recirculating heated air, there being an insulated baffle between the heating units and the charge as can be seen in Fig. 3. Each furnace is equipped with five-motor-driven fans located in a line in the top to recirculate the air rapidly to all portions of the charge.

After the work is heated to the required temperature, the bottom door is opened and the charge is lowered automatically into the water-quench tank, located directly beneath the furnace. This affords minimum exposure of the heated work to the atmosphere.

Three new roller-hearth furnaces were installed for the copper brazing and heat treating of track links for continuance type caterpillar tracks. Each furnace consists of three chambers, one for the brazing, the second for cooling after brazing, and the third chamber for reheating before hardening. Such "combination" of operations into one continuous series greatly increases production rates, conserves floor space, cuts costs.

The parts are loaded on trays and are carried through the three chambers by means of the driven roller hearth thus eliminating the need for intermediate handling between the operations. One of these installations is shown in Fig. 4.

New pusher-type furnaces (Fig. 1) were developed and placed in operation for the heat treatment of projectiles. The furnace hearth consists of V-shaped alloy castings running the full length of the furnace. Several parallel rows of projectiles are pushed through the furnace simultaneously. A typical furnace of this type heats several hundred shell bodies per hour.

A new design of electric vertical cylindrical furnace for heat treating tubular-shaped parts employs a transfer hood to hold heat in the work. The typical installation shown in Fig. 5 consists of vertical cylindrical furnaces for hardening, an oil-quench tank, a vertical cylindrical drawing furnace, a high-speed hoist, and controlled-atmosphere equipment in addition to the transfer hood. Thin-wall tubular-shaped parts used on landing gear equipment for airplanes are handled here. The parts are suspended from a suitable fixture seen in the center rear of Fig. 5, during the heat treatment.

After the charge is heated to the proper temperature for hardening, the operator opens the furnace cover and attaches the hoisting hook to the load support, the star-shaped fixture frame having rested on a ledge near the top of the furnace chamber. The charge is then raised out of the furnace into a steel hood attached to the hoist. Next the hoist is moved over the oil quenching tank and the charge quickly lowered into the oil. The entire time for this operation is a matter of seconds. The use of the transfer hood minimizes cooling, warpage and oxidation.

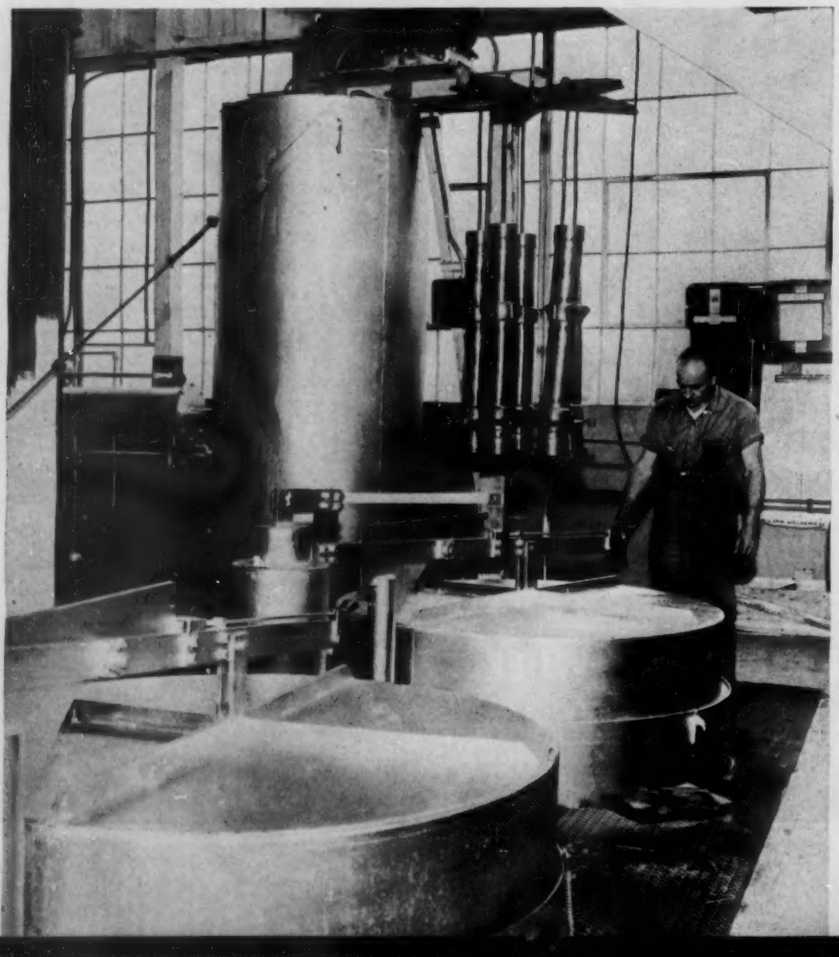

Fig. 5—Vertical cylindrical furnaces and oil quench tank. Working chamber is 30 inches in diameter, 60 inches deep. Tubular parts remain on rack seen in background while heated and quenched

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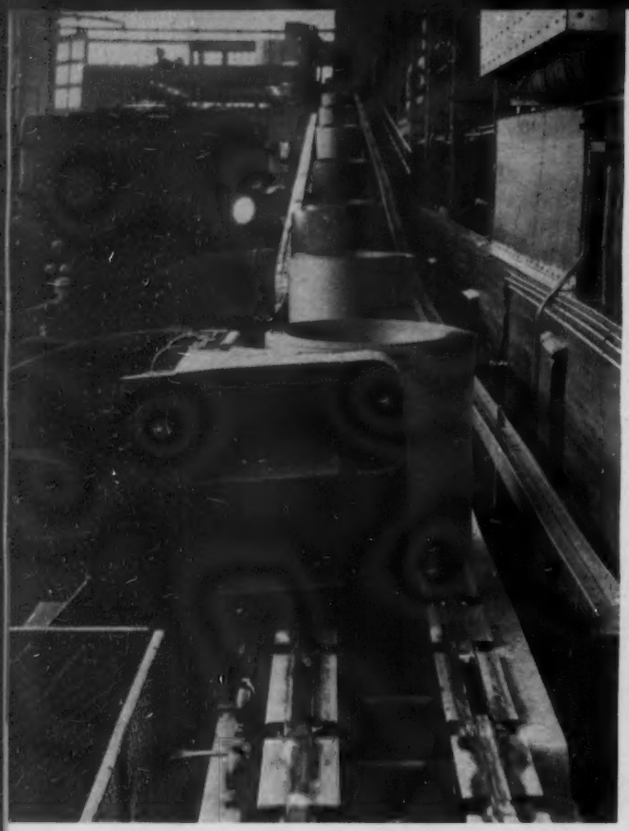


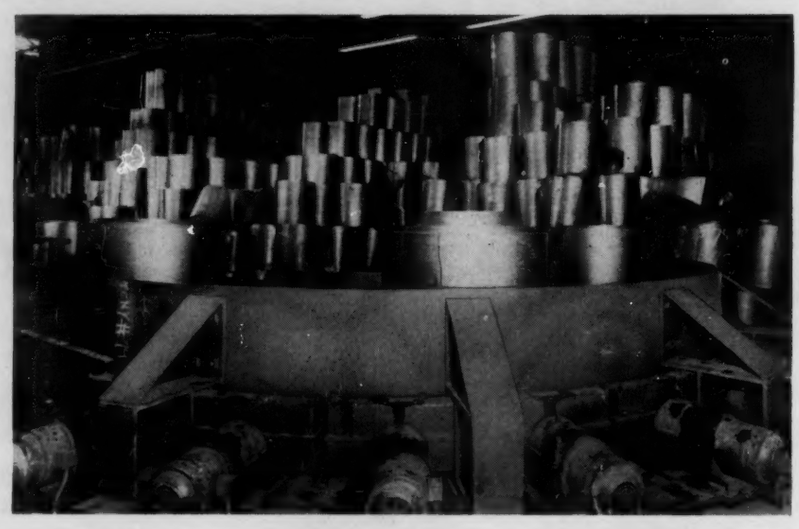
Fig. 1. (Above)—A hot-coil conveyor consisting of long-pitched chains supported by flanged drums operating in roller bearings. Chain elements can be seen in foreground

Fig. 2. (Right)—A 180-degree, motor-driven, tapered-roller transfer can be utilized to connect two parallel hot-coil conveyors as is done here

Improvements in

HOT-COIL CONVEYORS

By J. E. McBRIDE
Vice President
Palmer-Bee Co.
Detroit



ONE OF THE most spectacular sights in any steel mill is the hot slab emerging from the heating furnace, passing through scale breaker, roughing stands and finishing train to emerge a glowing hot ribbon of steel that moves swiftly over the long runout table to disappear with a swish into the coiler at speeds of 2000 feet per minute or more. Within three minutes a 6-ton slab of steel has become a tightly rolled coil of strip. At the coiler, it is pushed from the mandrel upon the hot-coil conveyor, which carries it from the coiler to the coil storage area.

The mechanical handling of hot coils begins at the down-ender or tilter which receives the coils as they are stripped from the mandrel of the coiler at the end of the runout table. Mechanical handling of the hot coils ends at the point where the coils are stored prior to shipment or for further processing—a distance that may vary from a few hundred feet to 1000 feet of more.

The conveyor receives the hot coils at a considerable distance below the mill room floor (when a down-coiler is used) due to the stepdown from coiler to down-tilter, and from down-tilter to conveyor.

According to the mill layout, the hot-coil conveyor may run parallel to the mill and receive its load over the side, or it may run at right angles to the mill and receive its load in line with movement of the down-ender—the most common arrangement and simplest mechanically.

Subsequently the hot-coil conveyor carries the coils up a slight incline (7 degrees is typical) to the mill room floor level, where the conveyor then continues on the level. This level portion of the line may be long or short, may run in either direction from the transfer point or be reversible. It may be of one construction or a combination of several types of conveyors.

From the level conveyor section, coils are usually transferred to storage by a magnet crane, or the coils may be discharged over the head end to a down-ender for distribution to storage areas by ram trucks.

While the hot-coil conveyor is used chiefly for transporting the coils to the storage area, it also allows the coils to be measured for width and gage, as well as affording an opportunity for them to cool for better and safer handling through subsequent movements.

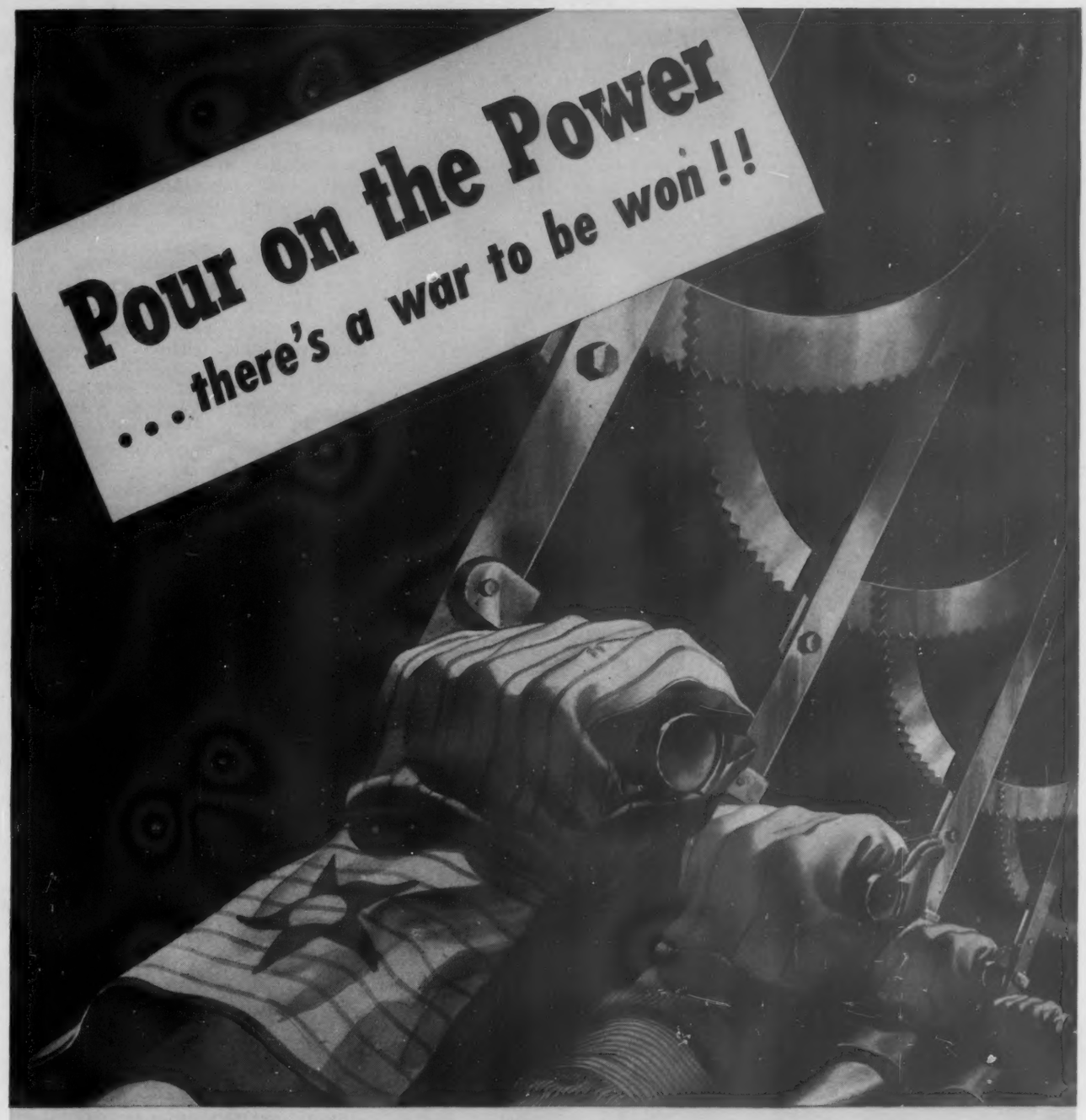
Requirements of a hot-coil conveyor include: Automatic loading at the receiving point (the down-ender from the coiler), automatic 90 or 180-degree transfer from one conveyor to another, automatic weighing and recording of the coils. In addition it must guard against mechanical damage to coils while in transit and protect them from grease. It should reduce manual operations to a minimum if for no other reason than because of the intense heat.

It should be free from any possibility of breakdown since it is the vital link between the hot mill and coil storage. For this reason and to withstand shock due to loading and impact of the magnet at the unloading end, it should have a high factor of safety. Usual capacity is from 100 to 120 coils per hour (depending, of course, upon the capacity of the mill served).

These specifications are important for today hot-coil conveyors must handle coils having widths up to 100 inches, weights up to 15 tons and temperatures up to 1200 degrees Fahr. Maximum load on the conveyor is about 5000 pounds per lineal foot, a value which is about three times more than the average fully loaded freight train per foot.

Six different and distinct designs of hot-coil conveyors are in use in the 14 or more modern continuous strip mills in this country. In five of these designs, the conveyor con-

Abstracted from an article in *Iron and Steel Engineer*.



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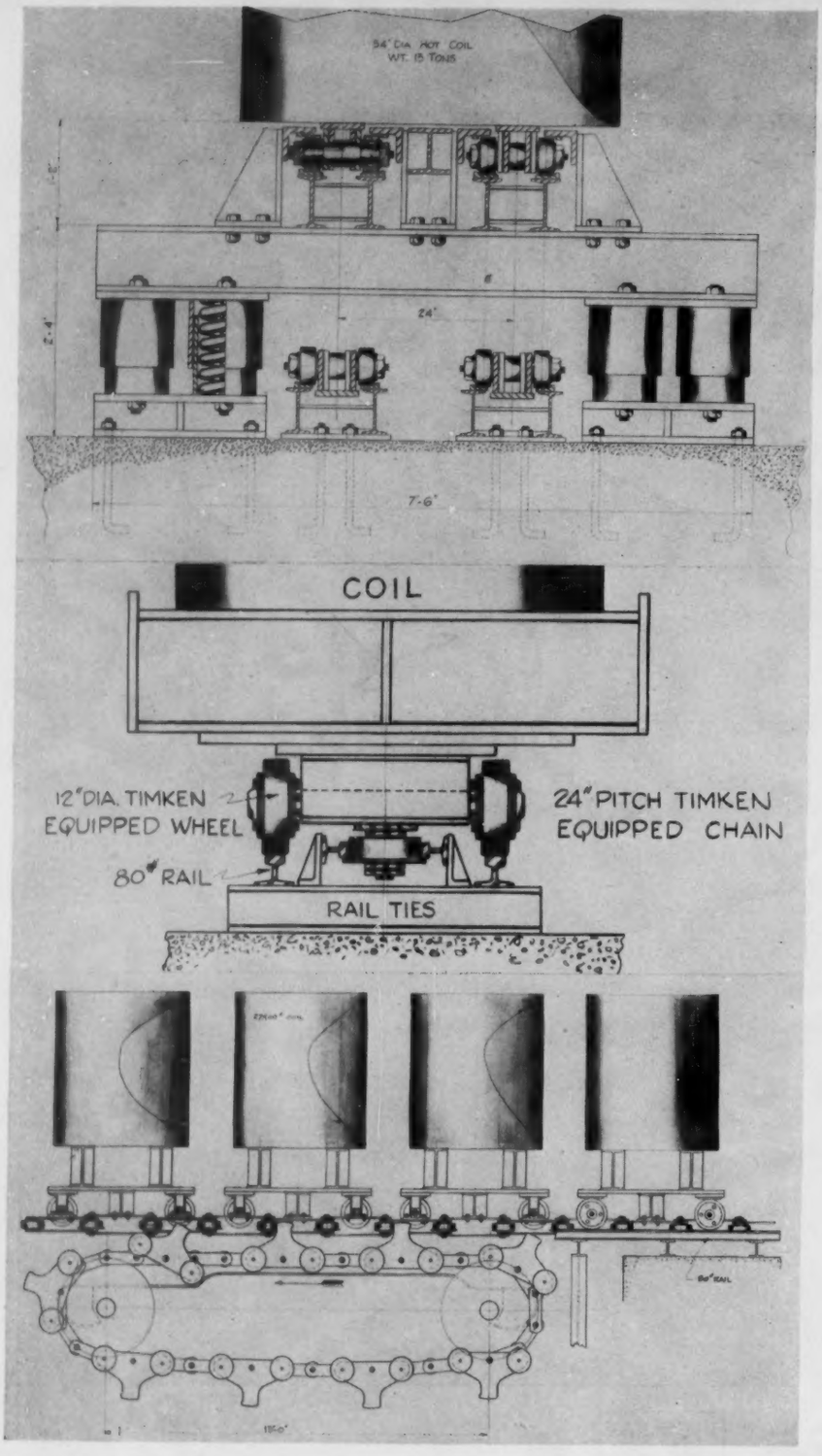


Fig. 3. (Upper view)—This modification of the "all-in-one" conveyor uses two outboard rollers rather than a single roller in the center of the chain. Rollers are more accessible and are more easily guided

Fig. 4. (Center view)—"Carry-all" conveyor is designed for use where two parallel chains cannot be employed

Fig. 5. (Lower view)—In the caterpillar drive for the "carry-all" type of conveyor, power is applied to conveyor at two or more points continuously. This type of drive permits conveyor to be arranged in form of long, narrow loop

sists of two parallel chains spaced on centers 24 to 30 inches apart and not connected in any way. A clear space between the inside edges of the two chains of approximately 18 inches permits the arm of the down-ender from the coiler to deposit the coils evenly upon the two chains. The tops of these chains present a wide, smooth surface on which the coils rest. Here the similarity of the five designs ceases, so the six different designs will be described briefly.

First is the sliding chain design wherein two heavy block-type chains slide in channel shaped tracks fitted with wearing strips and mounted on I-beam stringers, the coils resting directly on the chain links. While this was the earliest design, it is used in some of the most recent installations. Its advantages are that it is simple in design, consists of few parts, withstands shocks, can be easily and quickly repaired.

On the other hand, the length of conveyor handled by one drive and motor is limited to about 100 feet for medium weight coils and to about 50 feet for maximum weight coils. These limitations are due to sliding friction. To determine chain pull for a lubricated track, a value of 20 per cent of the total moving load while running is used and 50 to 100 per cent for starting from a position of rest. These percentages are employed where the load pressure on the chain is about 200 pounds per square inch. If the pressure is increased, the coefficient of friction also is increased.

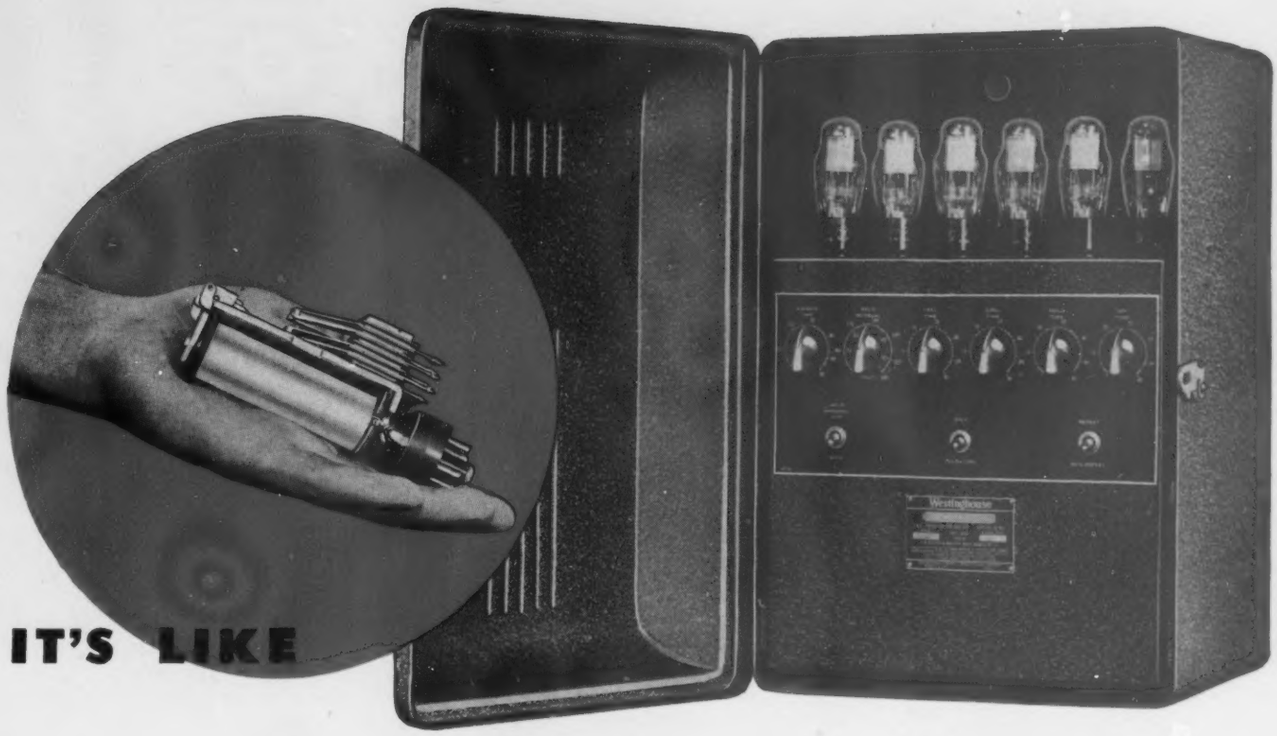
While the sliding chain is simple and rugged, it is evident that the economies in the conveyor design are easily offset by the extra-heavy drive mechanisms and motors. For long conveyors, the additional drives and transfers still further increase the total cost.

Second: To obtain the mechanical advantage of the wheel and axle and to use antifriction bearings, a variation of the sliding chain has been developed which employs a bed of commercial ball-bearing rollers under each strand of the chain. This is called the gravity roller design. Installations of this type are to be found in the mills at Youngstown and Gary.

Third: Another variation of the original type of sliding chain lengthens the chain pitch from 12 to 24 inches, provides a wider top surface to support the weight of the coils, carries the chains on large diameter flanged drums mounted on through-shafts with ends supported in self-aligning roller bearings and space 22 inches apart, a little less than the chain pitch of 24 inches. Fig. 1 illustrates this design.

This type appears to meet all the demands of a hot-coil conveyor. The long pitch is an economical design, and there is only about one lubricating point to each foot of conveyor. It has been built with one drive in lengths over 500 feet. This type is employed at Ford Motor Co.

Fourth: A variation of this latter idea simplifies the construction and combines all rollers and antifriction bearings into the design of the chain itself. See Fig. 6 for diagram of this construction. Pitch of chain is 18 inches, width of top support-



changing a radio tube

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J-21189

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RESISTANCE WELDING CONTROL

ing plates is 6 inches, and rollers at the articulation joints are approximately 7 inches in diameter and 4 inches wide in the face. Precision roller bearings are employed.

This is a compact design with only the normal number of parts required. It is made of alloy heat-treated steels, hardened and ground, and parts are increased in size to withstand the maximum loads and shocks. Lubrication is simple since it is required infrequently. It is arranged so b lubrication points travel past either an automatic or manually operated lubricator. Fig. 6 diagrammatically presents details of this type of construction.

In this and in design No. 5, a coefficient of friction of only 2 per cent of the total moving load is used in determining the chain pull since there is an advantage of at least 10 to 1 rolling friction over sliding friction here. Republic Steel Corp. in Cleveland, the Irvin mill of Carnegie-Illinois Steel Corp., and one of the Bethlehem plants employ this type of hot-coil conveyor.

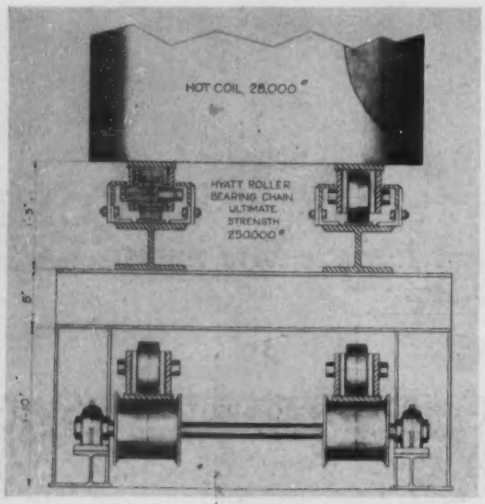

Fig. 6—All rollers and antifriction bearings are combined into the chain itself in the "all-in-one" type of conveyor as shown here. On return side inverted chain rides on large stationary rollers

Fifth: A modification of the all-in-one conveyor is to place the precision roller bearings on the ends of the extended chain joint pins, making two outboard rollers in place of a single roller in the center of each strand. With this construction, illustrated in Fig. 3, the rollers are more accessible and so can be quickly removed and replaced without dismantling the chain. Also the construction appears to have greater stability, and the chains can easily be guided on their track through the unloading area.

Of course it has more parts since twice the number of rollers and four times the number of bearings and three times the number of lubrication points are involved. This outboard roller type is used at Tennessee Coal, Iron & Railroad Co.; Youngstown Sheet & Tube Co.; and Great Lakes Steel Corp.

Sixth: A basically different design than the other five has been developed to meet a condition where two parallel chains cannot be used. In this case the conveyor operates in a single horizontal plane in the shape of a long, narrow loop about 800 feet long. Fig. 4 diagrams the construction. This endless conveyor is driven by two 50-horsepower caterpillar drives, each arranged as shown in the elevation diagram Fig. 5.

The object of this type of conveyor is to cool the coils for a period of an hour while they travel some 600 feet on the conveyor before being taken off. This "carryall" type of conveyor consists of a heavy single chain of 24-inch pitch, ultimate strength of 250,000 pounds. The chain is set on edge with the joint pins vertical to permit flexing of chain and conveyor in the horizontal plane. Four-wheel car or truck spaced 6 feet apart are attached to the chain links and are designed so the truck axles are always radial with the center of the curve when making a turn at the ends of the loop. This construction permits the making of short-radius turns.

The conveyor is loaded by two retractible down-tilters at the coilers and unloaded by a retractible tilter at the end of the cooling. The conveyor will run a distane of 6 feet, then stop while loading and unloading simultaneously, the cycle being repeated automatically by electric control. The unloading tilter delivers the coils on their sides over a weight scale to an inclined cradle-type conveyor which runs to the millroom floor and to storage where the coils are removed by crane and piled on their sides. A conveyor of this type will be in operation soon at the Weirton Steel Co.

It was mentioned previously that in most installations the coils are loaded upon an inclined conveyor running at right angles to the mill and up to the mill floor where coils are delivered through an angle of 90 degrees to a long cooling conveyor running parallel to the mill and to storage. This 90-degree turn is an important part of the conveyor system for it must deliver coils from one conveyor to the other without injury or shock. Also their stability must not be disturbed, especially important in handling wide coils. There are two methods of making this transfer.

First: Two short flat-top chains with caterpillar drives may be used between the two main conveyor chains and flush with their tops. These pick up the coils a few feet back of the head end of the inclined conveyor and extend a few feet beyond in order to bridge the space where there is little support for the coils. These short caterpillar chains keep the coils moving steadily upon a few gravity rolls mounted on a pivot arm. These rolls drop through and deposit the coils upon the storage conveyor chains.

Second: The 90-degree and 180-degree transfer also can be made with power-driven tapered rolls designed to present a level top surface. Gear head motors may be employed with every other roll only being driven as shown in Fig. 2.

Both the methods appear to accomplish the purpose equally well.

Regardless of type of conveyor, to withstand the shocks of the unloading magnet, the conveyor substructure at the unloading points is mounted on springs. These heavy springs usually are slightly precompressed to permit a little give at the impact of the magnet.

Emergency Actions Feature ASTM Week

Numerous emergency actions on important specifications and test methods were featured at the 1942 American Society for Testing Materials "committee week" held in Cleveland the forepart of March. During the week more than 520 technologists took part in the meetings.

Practically all of the 150 meetings were well attended—particularly so were those concerned with steel, rubber products and petroleum.

To aid the war effort, the society recently took steps to streamline its standardization procedure. Now, a main committee can refer recommendations to the society's standards committee at any time during the year with supporting letter ballot. During the war such requests can come from the subcommittee without requiring action by the larger group. While this is an emergency arrangement and does not concentrate responsibility in a smaller working group, the subcommittees, even in normal times must initiate and direct the standardization and research work.

In the next few weeks a large number of emergency alternate provisions will be issued ,according to the society. Gummed stickers with full details will be sent to all those who use the ASTM standards.

Since this year is the book of standards year, the society will again re-issue in three parts its volume of specifications and standard tests.

It's up to American Industry

From all over the world, frightened, helpless eyes peer through the mists of war toward American smokestacks. *Will children die of hunger? Will rifles in men's hands have bullets? Will the air above them swarm with friendly planes . . . or hostile?* It's up to American industry.

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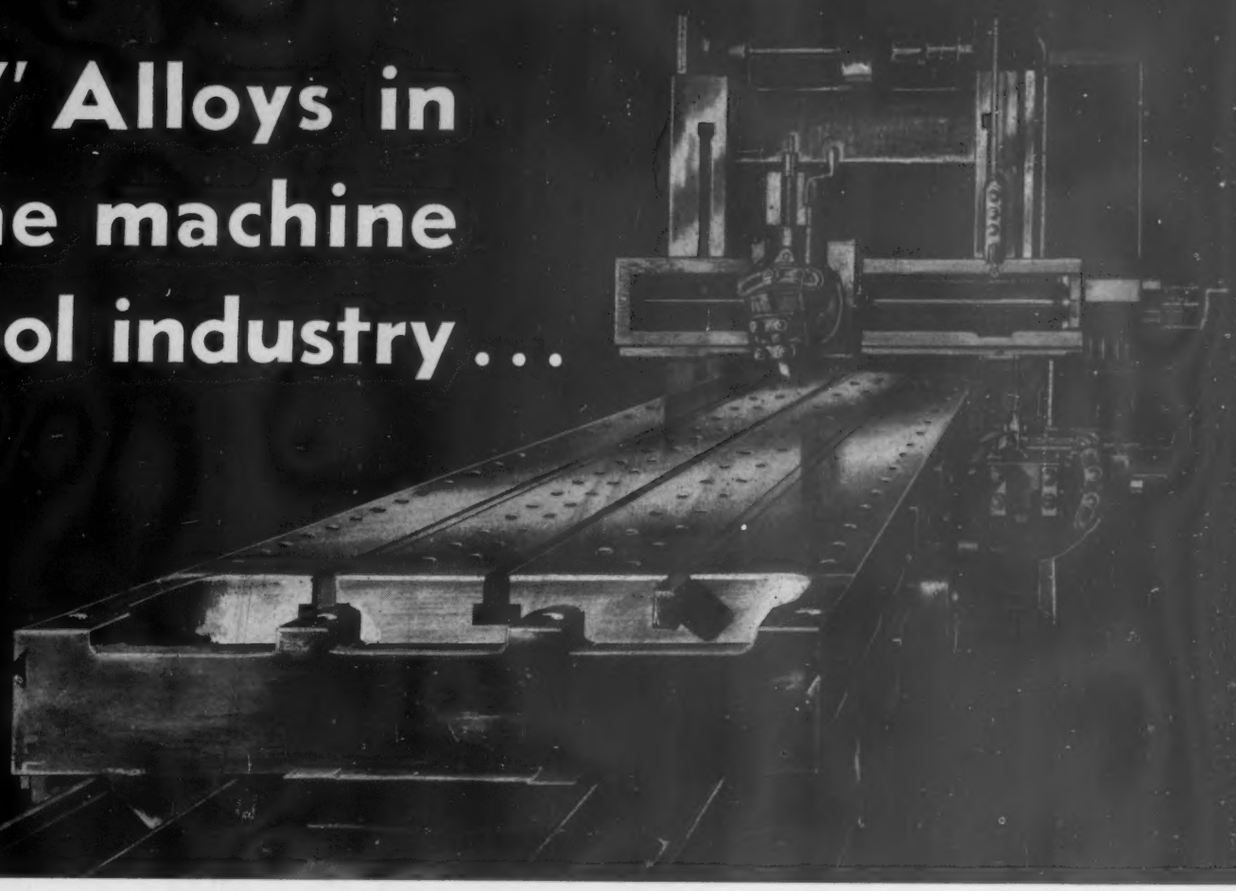

Two unusual requirements of gray iron for machine tools:

- **Uniform properties over a wide range of section;**
- **Wear resistance in heavy section.**

Both of these requirements demand structure control — to develop balanced properties, uniformity, density, and at the same time, machinability. To get this structure control, some form of treatment is required which causes cast iron to be relatively insensitive to cooling rate.

V-5 and V-7 Alloys were developed for the specific purpose of harnessing this usually elusive property. These alloys reduce and stabilize chill depth and, by eliminating chilled edges, improve machinability. At the same time, they improve physicals by producing a denser, harder iron in heavy slow-cooling sections.

For example, an iron of T. C. 3.27%, Si 1.39%, Mn 0.84%, P 0.20%, S 0.06% gave the following results:

	Plain	Treated with 1% V-5
Tensile Strength	38,000 p.s.i.	41,500 p.s.i.
Transverse Strength	2,600 p.s.i.	2,960 p.s.i.
Deflection	.28"	.32"
B. H. N. (Center of bar)	217	227
Chill Depth	.750"	.400"

Structure in the plain iron: eutectiform graphite, cellular.
Structure in the treated iron: random graphite, plus pearlite.

V-Foundry Alloys are further remarkable in that they combine alloying with processing. Excess additions over a considerable range do not upset the balance established by the processing minimum, but effect only a true alloy-improvement in physical properties.

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FERRO-ALLOYS

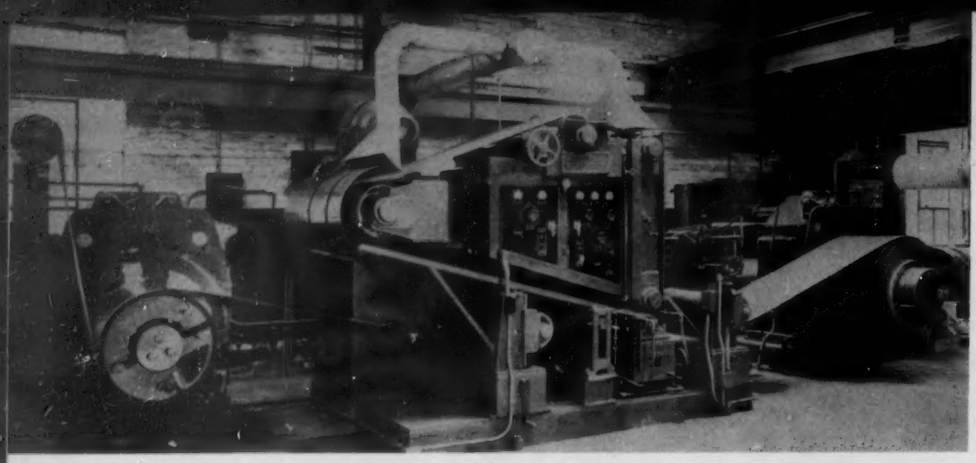


Fig. 1—Strip grinding and polishing machine with tension reels

Maintaining Constant Speed And Tension in STRIP REELING

Control system uses fewer devices, requires lower maintenance and less floor space for control equipment, and gives a wide range of adjustment of both strip speed and tension which are maintained automatically as preset. Only one current regulating device, the amplidyne exciter, is required for both reel motors

By E. S. MURRAH
Industrial Engineering Department
General Electric Co.
Schenectady, N. Y.

WINDING and unwinding of material require that the linear speed and tension remain substantially constant (while the material is being wound) and that both the speed and the tension be independently adjustable over wide operating ranges. Some applications also require that tension be maintained during acceleration, deceleration, and stalled conditions. If the drive is for reversing service, tension must also be maintained during reversal. Failure to maintain constant linear speed and tension may cause the material to stretch, tear, or produce uneven wraps on the reel drum, depending upon the application.

To meet the requirement of wide range of speed adjustment, direct-current motors supplied from a generator with adjustable-voltage control are used to drive the winding and unwinding reels. At constant voltage, the range of motor speeds obtainable by field weakening is somewhat larger than the ratio of the coil diameters between full reel and empty reel, thus making it possible to maintain constant strip speed by field control alone.

To meet the double requirement of wide range of tension adjustment and of maintaining constant tension while the diameter of the winding reel is increasing and the diameter of the unwinding reel is decreasing, use is made of an amplidyne exciter for current regulating control.

An example of the application of this type of control is found in the reel drive of strip grinding and polishing machines as shown in Fig. 1. This machine consists essentially of two reels arranged in such a manner that the steel strip may be wound from one to the other and back again. The strip is ground or polished by suitable means as it passes from one reel to the other.

Separate Motors Provided

Each reel is driven by a 10 horsepower adjustable-speed direct-current motor, both motors being supplied with power from a 5 kilowatt 250-volt generator. A 1½-kilowatt 40-volt booster generator is provided for maintaining stalled tension and also for providing IR drop compensation. To maintain constant tension, one amplidyne exciter is used as a current regulator for both reel motors.

Fig. 2 shows the armature and field circuits of these machines. All contacts marked RW are closed when winding on the right reel and likewise all contacts marked LW are closed when winding on the left reel.

The strip speed is determined by the voltage of the generator and may be preset over a wide operating range by the rheostat in the generator field circuit.

The tension is determined by the setting of the tension-adjusting rheostat in the control field circuit of the amplidyne exciter.

The diameter of the coil on the unwinding reel and consequently the torque to be developed by this reel motor decreases as its speed increases throughout the unwinding process. The opposite is true on the winding reel where the diameter of the coil and the torque of the reel motor increases as speed decreases throughout the winding process.

To maintain constant tension at constant strip speed the electrical input (volts and amperes) to the winding reel motor must be held constant. In the case of an unwinding reel, to maintain constant tension at constant strip speed, the electrical output must be held constant. In both cases the mechanical and electrical losses are neglected.

On drives where the strip speed is determined and held constant by some external source, such as a pair of rolls of a cold strip mill, the regulating device need hold only constant input to the winding reel motor.

On this particular application, there is no outside means of holding constant strip speed; however, the amplidyne in holding constant electrical input simultaneously strengthens the field of the winding reel motor and weakens the field of the unwinding reel motor in the proper proportion so that approxi-

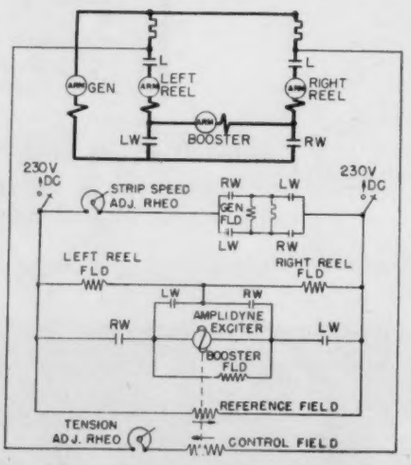
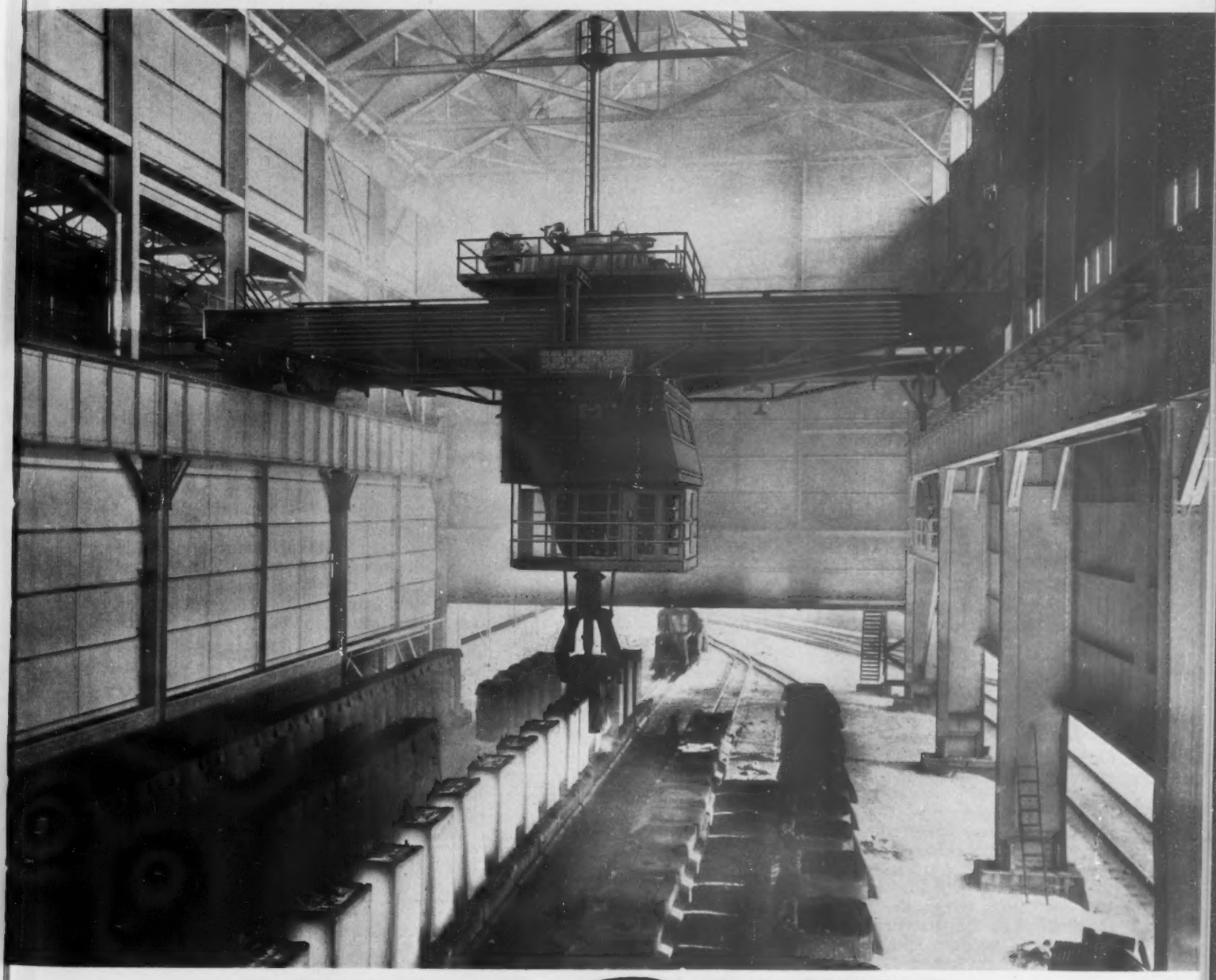


Fig. 2—Armature and field circuits of winding and unwinding reel motors

STRIPPING SLAB INGOTS

● Illustrated is one of two Morgan 200-ton, 64′0″ Span Ingot Strippers at work stripping slab ingots (Max. 32″ x 63″ x 72″). Efficient and dependable — such huge machines play an important part in stepping up steel production to meet present-day demands. Morgan Engineers have designed and developed strippers to perform three distinct stripping operations without making changes in the stripping unit. (1) These machines will strip small-end-up or standard ingots (2) Strip big-end-up hot top ingots (3) Break small-end-up ingots loose from stools. With this arrangement it is possible to strip a mixed heat without any lost time.



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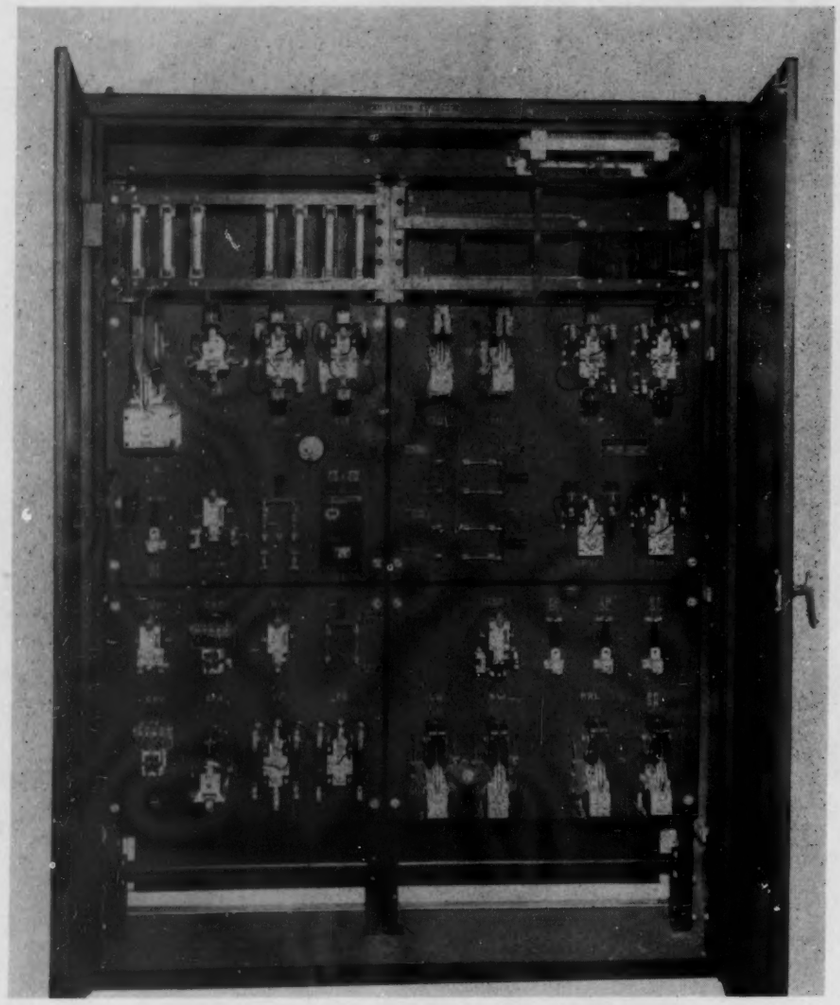

Fig. 4—Control panel providing for reversing of reels and adjustable voltage control for generators serving reel motors and sanding belt

mately constant strip speed is maintained. Therefore, constant tension is maintained as the strip is wound from one reel onto the other.

The diagram of connections given in Fig. 2 shows how the changes in torque (shunt field strength) on the two reel motors are accomplished automatically and simultaneously. The fields of the left and right reel motors are permanently in series across the 230-volt direct-current supply and the amplidyne exciter is connected by the closing of the RW contactors (when the right reel is winding) or of the LW contactors (when the left reel is winding) so that its current adds to that of one field and subtracts from that of the other.

The amplidyne exciter has essentially a control field which is connected across a resistor consisting of two sections, one in each of the reel armature circuits. The reference field and the control field (which is smaller than the reference field) are in opposition and the net difference in the excitation of these two fields excites the amplidyne in such a direction as to hold the current approximately constant at the value called for by the setting of the tension-adjusting rheostat.

As the diameter of the winding reel increases, the reel motor tends to draw more current. This strengthens the control field of the amplidyne which reduces the net difference between this field and the reference field thereby reducing the voltage output of the amplidyne. This in turn weakens the field of the unwinding reel motor and simultaneously strengthens the field of the winding reel motor. Thus the amplidyne circuit automatically compensates for the change in the torques developed by the two reel motors and maintains constant tension in the strip throughout the winding process as shown in Fig. 3, which gives the calculated tension and strip speed curves vs. reel diameter. In addition, the amplidyne exerts continuously a fast corrective action in one direction or another to maintain at all times the desired tension at the desired speed.

In the application described in this article, the reel motors are each rated 10 horsepower, while the generator supplying power to these motors is rated 5 kilowatt and need be only large enough to supply the electrical and mechanical losses in the machine since the winding reel operates as a motor to drive the unwinding reel as a drag generator, the latter returning power to the system.

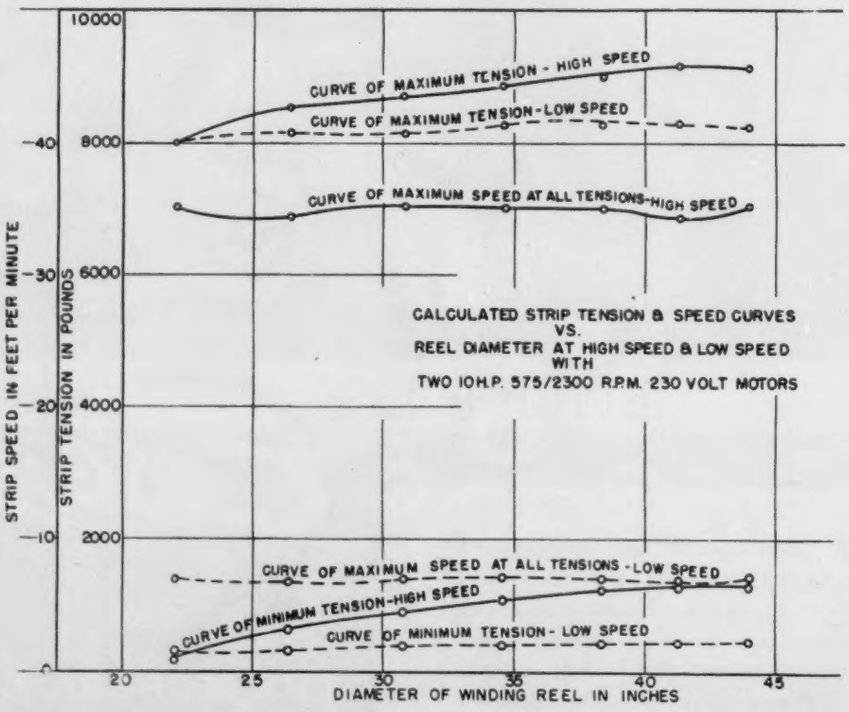
CURVE OF MAXIMUM TENSION - HIGH SPEED
CURVE OF MAXIMUM TENSION - LOW SPEED
CURVE OF MAXIMUM SPEED AT ALL TENSIONS - HIGH SPEED
CALCULATED STRIP TENSION & SPEED CURVES VS. REEL DIAMETER AT HIGH SPEED & LOW SPEED WITH TWO 10 H.P. 575/2300 R.P.M. 230 VOLT MOTORS
CURVE OF MAXIMUM SPEED AT ALL TENSIONS - LOW SPEED
CURVE OF MINIMUM TENSION - HIGH SPEED
CURVE OF MINIMUM TENSION - LOW SPEED
STRIP SPEED IN FEET PER MINUTE
STRIP TENSION IN POUNDS
DIAMETER OF WINDING REEL IN INCHES
10000
8000
6000
4000
2000
40
30
20
10
20
25
30
35
40
45

Fig. 3—Speed and tension characteristics for typical reel drive under amplidyne control

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What can I learn from this peace-time product to guide me in making plans for the post-war Battle for Business?

ALTER EGO: Well, the first big lesson is that the manufacturer points out that if this $900 car were built by the non-welding methods of 15 years ago, the cost would run $3000.

That's a saving of $2100 by welding and mass production. Could it be possible for me to apply the same method to my product to cut costs and boost volume for the tough years ahead?

ALTER EGO: You know there is a simple *plan* for changing over to welding, like that of the auto builders:

(1) Appoint a man of experience and give him authority to supervise welding developments.

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That sounds familiar. Doesn't The Lincoln Electric Company of Cleveland, Ohio, GUARANTEE that you'll profit from a plan like that? Why not write them for suggestions for changing over?

ALTER EGO: Literally, "one's other self"—the still, small voice that questions, inspires and corrects our conscious action.

How To Conserve WELDING ELECTRODES

17½% WASTE
COST PER 100 RODS $0.96
WASTE $0.168
STANDARD LENGTH BUTT-ENDS 2" TO 2½"
TO DATE THIS YEAR SHOP IS HAS REQUISITIONED 15,500 LBS. OF NO. 5 AND 7 AT A COST OF $1533.50
17½% OF $1533.50 = $268.36
NICE DOWN PAYMENT ON YOUR NEW CAR

Fig. 1—Typical example of waste from not burning electrodes down to standard stub length of 2 inches. Note wall display shows a 17½ per cent waste from this cause. A display such as this will do much to bring home the story of conservation to the welding operator in the shop

By CLAYTON B. HERRICK
Welding Engineer
Lincoln Electric Co.
Cleveland

TO DERIVE the utmost from the great potential advantages of welding in war production, it is important that welding materials, particularly welding electrodes, be utilized with maximum efficiency. Nowhere is the necessity of conserving materials in our war effort more urgent than in the use of welding. And in few places will proper attention to conservation produce more definite savings.

Important factors which influence the efficient utilization of welding electrodes are:

Right Type of Joints: A serious waste of weld metal results by using a complicated joint where a more simple type of connection will suffice. Since the type of joint greatly affects the amount of metal required, proper joint selection is one of the primary requisites for efficient utilization of weld metal. Obviously the joint to select is the one which meets the physical requirements and which permits deposition of the smallest amount of weld metal at the greatest speed and lowest cost.

Good Fit-up: Not only does poor fit-up reduce the physical properties of the joint and thus cut the performance of the finished product, but it also greatly affects the cost of the welded joint for it requires deposition of an excessive amount of weld metal. The case represented in Fig. 1 illustrates well the effect upon cost in making a T-weld with ¼-inch plate. Assume that the most of deposited metal is $1 per pound. Then if the joint is fitted properly as shown at extreme left, Fig. 3, the joint cost would be 40 cents per foot.

However, if there is a gap between the vertical plate and the horizontal plate of 1/16-inch as at the center in Fig. 3, this cost is increased to 58 cents per foot. Again, if this discrepancy is allowed to reach the proportion of ⅛-inch, the cost is increased to 80 cents per foot. Note the poor fit-up in the second instance has cost 18 cents per foot, whereas in the third instance it actually doubles the cost of the joint per foot. Obviously money spent in obtaining good fit-up is readily saved in welding. Fig. 3 shows that if 0.40-pound of metal is deposited per foot of joint when properly fitted, 0.58-pound of weld metal per foot is required with the 1/16-inch gap and 0.80-pound per foot for the ⅛-inch gap for this joint.

Correct Electrode Type: While a general purpose electrode will produce satisfactory welds under virtually every condition, special electrodes such as heavily coated fast flowing types are more efficient for many applications. Electrodes should be selected according to the physical properties desired, type of joint, position of welding and condition of fit-up work. Recommendations of the electrode manufacturer should always be followed.

Uniform Electrodes: If the electrode coating is not uniform, it will be difficult to prevent rejects from occurring in the work, for it will be remembered that the coating not only produces the gas which protects the molten metal that is being deposited, but also influences the solidity of the metal, penetration of

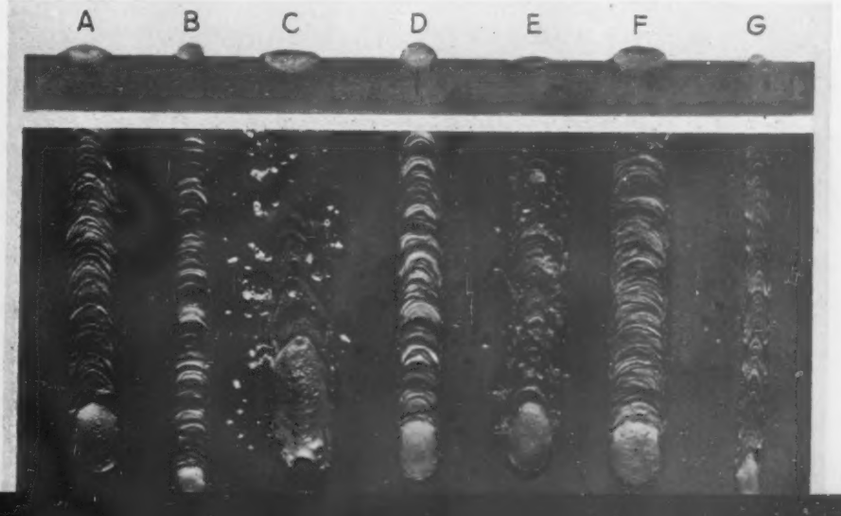

Fig. 2—These are the various types of beads that were deposited under the respective sets of welding conditions detailed in Table II

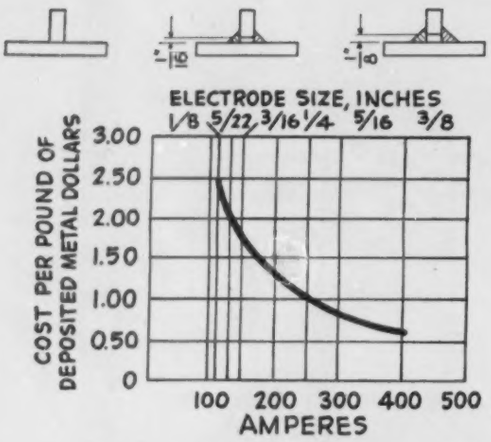

Fig. 3. (Upper view)—Improper gap in plates to be joined makes a difference of 0.18 and 0.40 pounds of weld metal per foot of joint respectively for the 1/16-inch gap, center, and the 1/8-inch gap at right as compared with the tight joint at left which requires only 0.40 pounds of weld metal per foot of joint

Fig. 4. (Lower view)—Effect of electrode size greatly influences cost of the deposited metal as is shown here

TABLE I—Effect of Changing Electrode Size

Electrode size	1/8	5/32	3/16	1/4	5/16	3/8
Amperes	110	130	150	250	325	425
Arc volts	24	25	26	30	34	38
K.W. at arc	2.64	3.25	3.9	7.5	11.1	16.1
Consumption rate, lbs. per hr.	2.6	3.3	3.95	7.5	10.7	16.2
Deposit, lbs. per hr., 50% operating factor	0.87	1.1	1.32	2.5	3.57	5.4
Efficiency of set, %	47	50	51	55	59	59
Kilowatt input	5.6	6.5	7.65	13.65	18.8	27.3
Interruptions per lb. consumed	18	12	8	5	3	2
Cost Per Pound Deposited						
Labor	$1.150	$0.909	$0.758	$0.400	$0.280	$0.185
Overhead	1.150	0.909	0.758	0.400	0.280	0.185
Power	0.064	0.059	0.058	0.055	0.053	0.051
Electrode	0.150	0.135	0.127	0.127	0.127	0.127
Cost of Interruption (including overhead)	0.050	0.033	0.022	0.014	0.008	0.005
Totals	$2.564	$2.045	$1.723	$0.996	$0.748	$0.553

the metal, shape of the bead, physical properties of the deposit and chemical composition of the deposit. Thus any nonuniformity in electrode coating shows up as nonuniform weld.

Physical Properties: Electrode manufacturers clearly describe the quality of weld that each electrode will produce. The physical requirements of the work at hand should be known and the electrode selected to meet these requirements.

Fast Flowing Rod: Certain types of electrodes are produced today which deposit metal at an extremely rapid rate. Obviously the proper use of such electrodes will save time in making welds.

Splatter Loss: Obviously all splatter is a waste of weld metal. Since the splatter loss varies with different types of electrodes, care should be taken to avoid the use of those types which have excessive splatter losses.

Flat Beads: The weld metal is wasted if more is deposited than is required. Excessively heavy "bulging" beads waste metal because they must be ground down to make a presentable joint. Thus not only is weld metal itself wasted, but much nonproductive time can be consumed in removing the excess metal to finish up the joint.

Right Electrode Size: From the standpoint of electrode conservation, the largest diameter electrode which can be used effectively is the best. The saving from this item runs up to as much as 40 per cent per pound of weld metal deposited—for example, when ¼-inch rod is used instead of 3/16-inch. The chart, Fig. 4, shows effect of electrode size on economy. Note how the cost of welding goes down as the electrode size goes up. Table 1 also gives some interesting data as to the effect of changing electrode size.

Note here that important savings are possible by changing to larger size electrodes not only because the metal from the electrode is melted off faster and so more pounds of metal deposited per hour, but also the number of stub ends is reduced and the interruptions to change electrodes per pound of metal deposited are greatly reduced. The cost table is particularly interesting.

Long Electrodes: Obviously much time will be saved by eliminating interruptions to change rods if a longer electrode is used. It is recommended that the 18-inch length be

TABLE II—Effect of Welding Procedure on Conservation of Welding Electrode

(For resulting weld appearance, see Fig. 2)

Characteristics of welds are a good check on electrode conservation. The effect of varying one factor in procedure is indicated below. Note what happens to electrode burn-off rate, weld penetration, appearance of weld and arc sound when the three factors of "arc current", "arc volts" and "arc speed" are varied from "normal".

	"F"	"A"	"B"	"C"	"D"	"E"	"G"
Arc current	Normal	Low	High	Normal	Normal	Normal	Normal
Arc volts	Normal	Normal	Normal	Low	High	Normal	Normal
Arc speed	Normal	Normal	Normal	Normal	Normal	Low	High
Rod Burn-off	Normal appearance, coating burns evenly	Practically same as preceding	Coating is consumed at irregular high rate; watch carefully	Coating too close to crater, touches molten metal resulting in porosity	Drops at end of electrode flutter and then fall into crater	Normal	Normal
Penetration	Fairly deep and well defined	Not very deep nor well defined	Deep, long crater	Small	Wide and rather deep	Crater normal	Small, rather well-defined crater
Bead appearance	Excellent fusion, no overlap	On top of plate, not as much overlap as with bare rod	Broad, thin bead; good fusion	High bead not as pronounced as for low amps. somewhat broader	Wide spattered	Wide bead, overlap large, base metal and bead excessively heated	Small bead, undercut, reduction in bead size and undercutting depend on speed and amperes
Arc sound	Sputtering hiss plus sharp crackling	Irregular sputtering, some crackling	Regular explosive sounds	Hiss plus steady sputter	Soft sound plus hiss and few crackles	Normal	Normal

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used with all electrodes ¼-inch and larger. At the same time a further important economy is obtained by reducing the number of stub ends.

Do Not Bend: This habit is usually unnecessary and is credited with wasting one-quarter to one-third of the electrode in practically every instance in which it is employed. Use the electrode straight and get the maximum amount of deposited weld metal from each rod.

Proper Voltage and Current: Every electrode manufacturer recommends operation of each type of his electrodes within a certain voltage and current range. If the welding current is too high or too low, it will manifest itself either as excessive splatter loss or as an inferior weld having improper fusion and penetration. It is exceedingly important that the detailed procedure specifications accompanying each different electrode be followed for these specifications have been prepared carefully by the electrode manufacturer and will prevent waste of electrode and assure high-quality welds if followed consistently.

Table II in conjunction with Fig. 2 shows what happens to electrode burn-off rates, weld penetration, appearance of weld and arc sound when the three factors of "arc current," "arc volts" and "arc speed" are varied from "normal."

Excessive Beads: If one bead of weld metal will meet design requirements, of course it is a waste of electrode material to add additional beads. This also applies where two beads will suffice. In all cases use as small a number of beads as the design will allow.

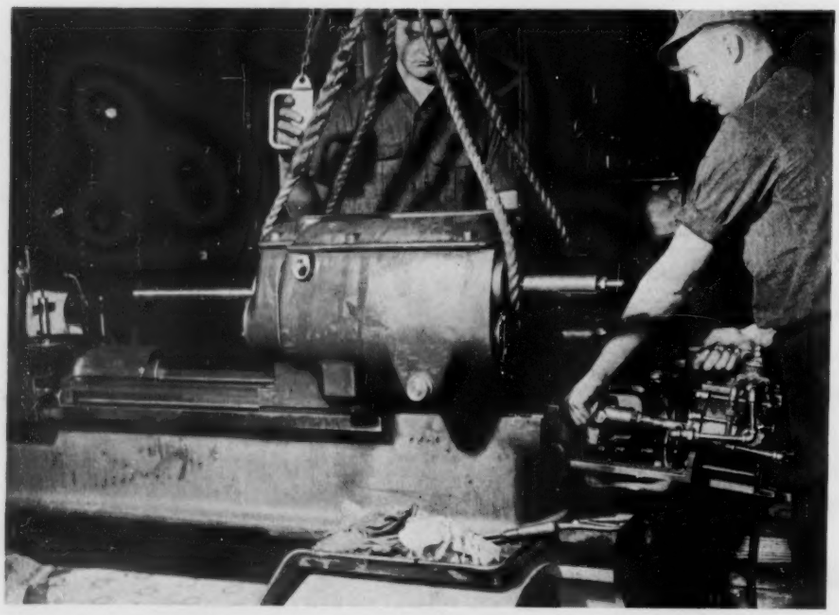
Minimize Stub Ends: Remember that the electrode can be used the entire length of its coated surface. Leaving more than this minimum stub end is simply a waste of that much material. By using care to grip the electrode at its extreme end in the holder and to burn off the maximum metal possible, the operator is rendering a patriotic service in saving electrode material. Just a half-inch difference in stub end length saves 3½ per cent of an 18-inch rod.

Fig. 1 shows the great variation in the length of stub ends in one welding shop. As indicated, this waste amounted to 17.5 per cent. In cost for the time covered, it amounted to $268.36—an extremely significant figure in any shop. The pile of excessively long stub ends just below the chart shows how easy it is to waste electrode material by not burning off the proper amount of electrode.

Save Stub Ends: At the rate welding is being used, the amount of metal that will be wasted by failure to save stub ends is tremendous. Even the standard stub length of 2 inches represents an extremely great loss when this length is multiplied by the millions of electrodes now being consumed.

Modern Generators: While older welding generators will deposit metal, modern welding generators with their higher capacity and greater efficiency do a better job. For example a modern 40-volt generator produced 7.7 inches of joint per electrode as against 6.6 inches of joint for the same type of electrode used with an older welding machine.

Giving Muscles "the Air"



USE OF air cylinders to move heavy headstocks back and forth over their lathe bed ways in aligning has both speeded up and made the operation safer at the plant of Monarch Machine Tool Co., Sidney, O. As illustrated, the air cylinder is clamped to the end of the lathe bed and its drawbar hooked into a slotted plate which is temporarily bolted to the bottom of the headstock. Manipulation of a lever-operated air valve controls the reciprocating motion of the drawbar and, consequently, movement of headstock

Save Your Rubber

(*Concluded from Page* 51)

Such linings should be inspected periodically. Protect against exposure to direct sunlight and to excessive heat. Generally while not in use it is good practice to leave in it the solution usually handled. Never fill the container with water as this may speed deterioration of certain grades of rubber.

Prevent mechanical abuse by use of wood, brick, lead or alloy bumpers or ledges to protect the linings against mechanical shock or abrasion.

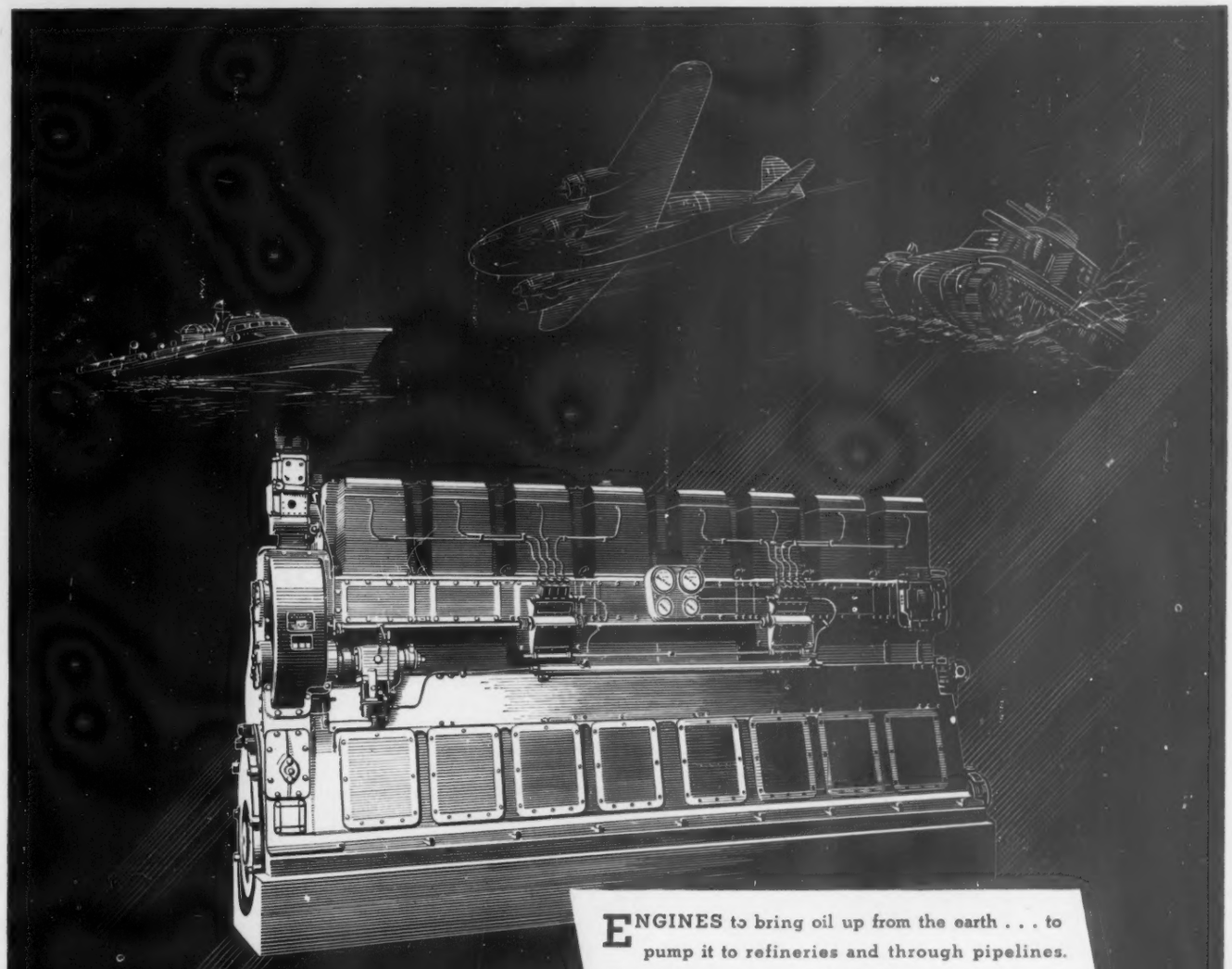
Avoid low temperatures or quick temperature changes. Never change service conditions radically without first consulting the supplier. Keep unlined portions of tank well painted to prevent corrosion from the outside. Where the liquid must be heated, avoid localized heating as this causes rapid deterioration of the rubber in those areas.

Institute Issues Two Additional Manuals

Two more steel products manuals —"Flat Steel Wire," section 17 and "Cold Finished Steel Bars and Shafting," section 9, are now available from the American Iron and Steel Institute, 350 Fifth avenue, New York. Both publications contain general definitions and manufacturing practices of the subjects discussed.

Powder Metallurgy Course

Ten-week course in powder metallurgy will be conducted by W. J. Baeza, Industrial Research Co., New York, starting early in April at College of the City of New York. Meeting two nights a week, the work will be directed by the Engineering, Science and Defense Management Training. No fees will be required. Applications should be made direct to the college, 140th street and Convent avenue.



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ENGINES OF PEACE!

ENGINES to bring oil up from the earth . . . to pump it to refineries and through pipelines. Engines to draw gas from American soil and carry it to thousands of homes and defense industries . . . to strip it of precious gasoline for American planes and tanks and trucks. Engines to compress ammonia to make gunpowder . . . to generate electricity for farms and factories. Engines to pack compressed air into torpedoes and discharge tubes . . . to power battleships, submarines, patrol vessels, mine layers, cargo ships. Yes! Engines of Destruction . . . to thwart those who would destroy us!

These are the things to which Cooper-Bessemer factories are dedicated . . . the tasks for which our workers are girded! These are the engines we must build today, to gain our Victory tomorrow . . . Out of them, will come better Engines of Peace!

THE COOPER-BESSEMER CORPORATION
Mount Vernon, Ohio

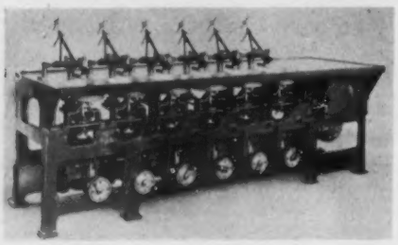
Cooper-Bessemer

ENGINE BUILDERS SINCE 1833

Industrial Equipment

Grinding Machines

George Scherr Co. Inc., 128 Lafayette street, New York, announces a line of Lehmann optical grinding machines capable of doing high precision work. Shown is one of the units in the line—a 6-spindle light duty polisher featuring hardened steel spindles running in adjustable bronze bushings. It is of the latest design for maximum range and will readily produce a large variety of work. The machine, frame and table are of heavy construction for rigidity in operation. Adjustment of spindle and crank speeds are easily made by releasing pin stops in indexing disks and rotating cranks



after disengaging friction described by hand levers. An Alemite central lubrication system is provided on all machines in the line. Also the crankshafts of these units may be operated at speeds of 41.5 to 132.5 revolutions per minute. The polishing spindle which is operated in three steps provides speeds of 76 to 243 revolutions per minute for the first step, 41.5 to 132.5 revolutions per minute for the second, and 22.6 to 72.4 revolutions per minute for the third.

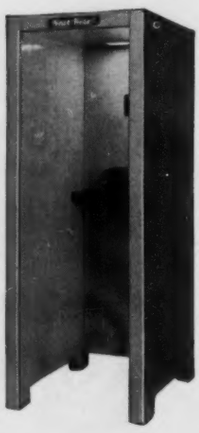
Speed Indicator

Reeves Pulley Co., Columbus, Ind., has developed a new electric remote speed indicator for use with its variable speed control equipment. It gives a reading in terms of "speed setting" of the output shaft of the drive, similar to the indication of the output speed given on the dial indicators of the transmission and Motodrive, the scale-type indicator on the Vari-Speed motor pulley or the Special handwheel applied to any of these units. The power supply for the indicator is self-contained in form of a standard size flashlight cell. The load on the dry cell is only 0.001 ampere or less, so the cell will last its "shelf-life" or more than a year. Both indicator and dry cell are left permanently connected, so the indicator continuously reads a

value proportional to the setting of the drive, regardless of whether the drive is running or not. Unit has an adjusting screw for either battery or power line type to permit convenient adjustment of the indicator reading to coincide with some previously established relationship between indicator reading and variable speed shaft.

Telephone Booth

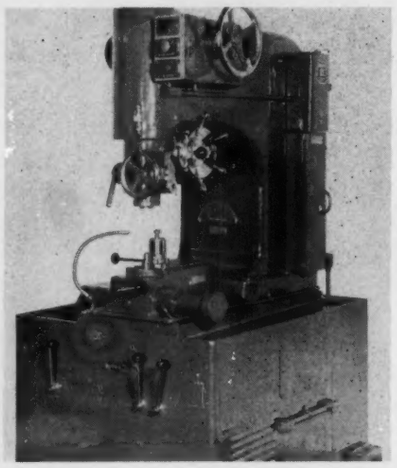
Burgess Battery Co., Acoustic Division, 530 West Huron street, Chicago, has developed a new line of Acousti-Booths constructed of heavy reinforced birch plywood for industrial use. The walls and ceiling of the booth consist of perforated, reinforced panels, which are filled



with a thick blanket of sound-absorbent material. Like other booths formerly of steel, the new model 207 provides a quiet place for telephone users in factories, power houses or other noisy industrial locations. It is equipped with a shelf for the telephone instrument, and for taking notes. An overhead electric light provides ample illumination.

Milling Machine

Snyder Tool & Engineering Co., 3400 East Lafayette street, Detroit, announces a new semi-automatic milling machine for milling master rods used in radial aircraft engines. It will rough or finish either solid or split-type rods. Since cutting cycle of the machine is automatic, being hydraulically operated and electrically controlled, one unskilled operator can maintain continuous production tending several such machines. In action, the main bore of the master rod is located on a plug, and a bored and reamed hole for the articulated rod is positioned on an eccentric bushing. The part is then hydraulically clamped by means of a clamping bolt and a C-washer over the hub. The cutting tool is rotated by a vertically adjustable quill-type spindle, which is



worm-wheel driven. The hydraulically-operated eccentric bushing acts as a driver for the path of the cut. Completion of machining cycle is indicated by a pilot light at which time the operator then indexes part, without unclamping it, for the next cutting cycle.

Locomotive

General Electric Co., Schenectady, N. Y., announces a new 45-ton diesel-electric locomotive which because of its simplified construction is easier to handle and maintain. Its features include four sets of steps leading to the platform—one set at each corner of the platform—making it convenient for the switchman to board the locomotive from the switchman's end-step while the locomotive is in motion. The two additional steps permit access to the platform in front of the engineman's window and on

A battery of South Bend Lathes producing airplane engine valves.

Where Production Calls for Precision

PRODUCTION for National Defense calls for precision. There can be no sacrifice in accuracy—even with the urgent demand for quick deliveries in vast quantities and the resultant speeding up of production schedules. And all work *must* pass inspection—there can be no scrapping of strategic materials—no delay in delivery—no wasted man power or machine time.

In hundreds of defense industries, precision keeps pace with production, through batteries of South Bend Lathes—like those shown above.

Modern in design, built with extreme precision, South Bend Lathes are fast and accurate on the most exacting classes of machine work. Their wide range of spindle speeds permits machining with maximum cutting tool efficiency. Their versatility facilitates quick change-over through a minimum of set-up time.

South Bend Lathes are made in five sizes: 9″, 10″, 13″, 14½″, and 16″ swing, with toolroom or regular equipment. Also turret lathes for multiple tool production operations. Write for catalog and the name of our nearest dealer.

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A practical reference book on lathe operation for beginners and apprentices. 128 pages, 5⅛″ x 8″. Price 25c, postpaid.

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SOUTH BEND LATHE WORKS

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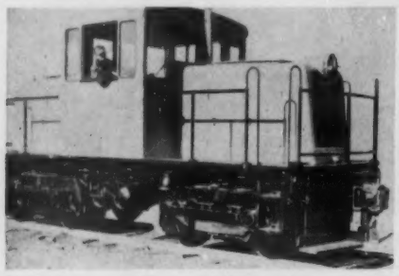
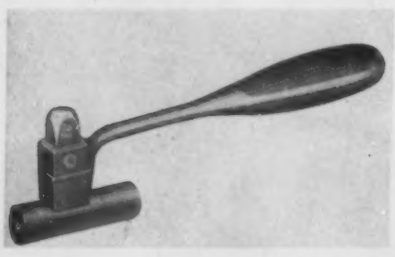
the corresponding place diagonally opposite. Handrails are incorporated to suit the new step location. Doors leading to the main cab now swing outward. Their design helps to reduce drafts and minimize water leaking into the cab. The controls are arranged to make them more convenient for the engineer while leaning out of the window. The engineer's sliding



windows are embodied so the middle third of the cab directly opposite the engineman's position can be opened. Half of the window slides forward and the other backward. The locomotive has two main air reservoirs. This conforms to railway locomotive practice, and provides drier air to the air-brake equipment. One large fuel tank instead of two makes the unit easier to refue'. The air compressor is attached to the engine sub-base.

Stamping Holders

Jas. H. Matthews & Co., 3942 Forbes street, Pittsburgh, has developed a steel stamp holding device for making hammer struck stamp impressions on steel products safely. It can be used for stamping either round or flat products. The base of the holder is V-shaped allowing a right angle alignment of the stamp when stamping round products. The stamp is held in place by means of a Shepherd hook holding device and floats up or down in order to find its own



location on varying diameters of round or oval shapes. An advantage of the holder is that it cannot be used upside down. Also, the stamps cannot drop out when not in use nor will they bounce out from rebounds caused by forceful hammer blows. The nature of the holding method allows the stamp in the holder to be in contact with part to be stamped when hammer blow is delivered, assuring a thoroughly legible impression. Any size steel stamp can be handled by the holder, it is said.

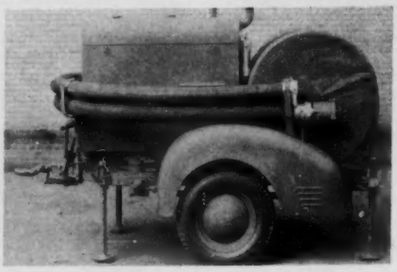
Electric Counter

Production Instrument Co., 704-16 West Jackson boulevard, Chicago, is offering a new Monitor model PDC-E predetermined electric counter for counting objects passing on a conveyor or delivered from a machine. Being electrically actuated, it may be located near to or at a distance from the things being counted. The instrument enables any number from 1 to 9999 to be set up quickly by simply turning its knob pointers to the proper digits. When the count reaches the predetermined number set up, a control and signal circuit is closed (or opened). The circuit may be used to sound an alarm or operate a relay. Counting ceases at the predetermined number until a reset lever makes the instrument

ready for a new cycle. The counter is actuated by any switch, relay or photo-electric unit with a closed period of 0.035-second or more and an open period of 0.040-second or longer.

Fire-Fighting Unit

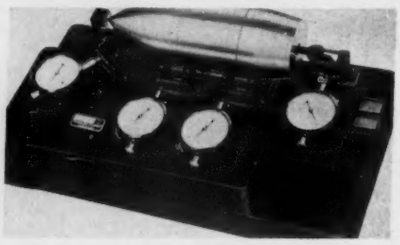
Chrysler Corp., 341 Massachusetts avenue, Detroit, has introduced a mobile fire-fighting unit which can readily be hauled as a trailer behind an ordinary passenger car or placed on a platform body of a light truck. It is designed for fighting incendiary fires and can be handled by two or three men. Unit comprises a Dodge 1½-ton truck engine rated at 95 horsepower, operating a Chrysler-Hale fire pump of 500 gallons per minute capacity at 120 pounds pressure. The pump also can be set up to deliver 250 gallons per minute at 200 pounds pressure for fires demanding a very powerful stream. The apparatus generally carries two sections of suction hose and 500 feet of 2½-inch standard fire hose. These may be mounted on two double reels or folded into a box-type body. A variety of nozzles to give either a heavy stream or a spray for fighting incendiary bombs also is part of the equipment. The engine and pump unit is mounted on skids so that it may be placed in a trailer. The trailer especially designed for the unit has two wheels equipped with standard size pneumatic tires.



It incorporates a coupling link that enables it to be hooked to the bumper of an automobile in a few seconds.

Concentricity Gage

Federal Products Corp., 1141 Eddy street, Providence, R. I., announces a model 205B-84 mechanical shell concentricity gage suitable for checking tracer or fuze holes, rotating band, bourrelet and ogive diameters. It handles in its V-block shell and projectiles up to approximately 14 pounds. Each indicator of the gage is equipped with a pantograph spring unit which protects the indicator from abuse, contributing to the instrument's accuracy and furnishing an adjustment for contact with the shell. The gage also is equipped with a sliding indicator and pantograph unit which contacts the fuze hole or tracer cavity and in-

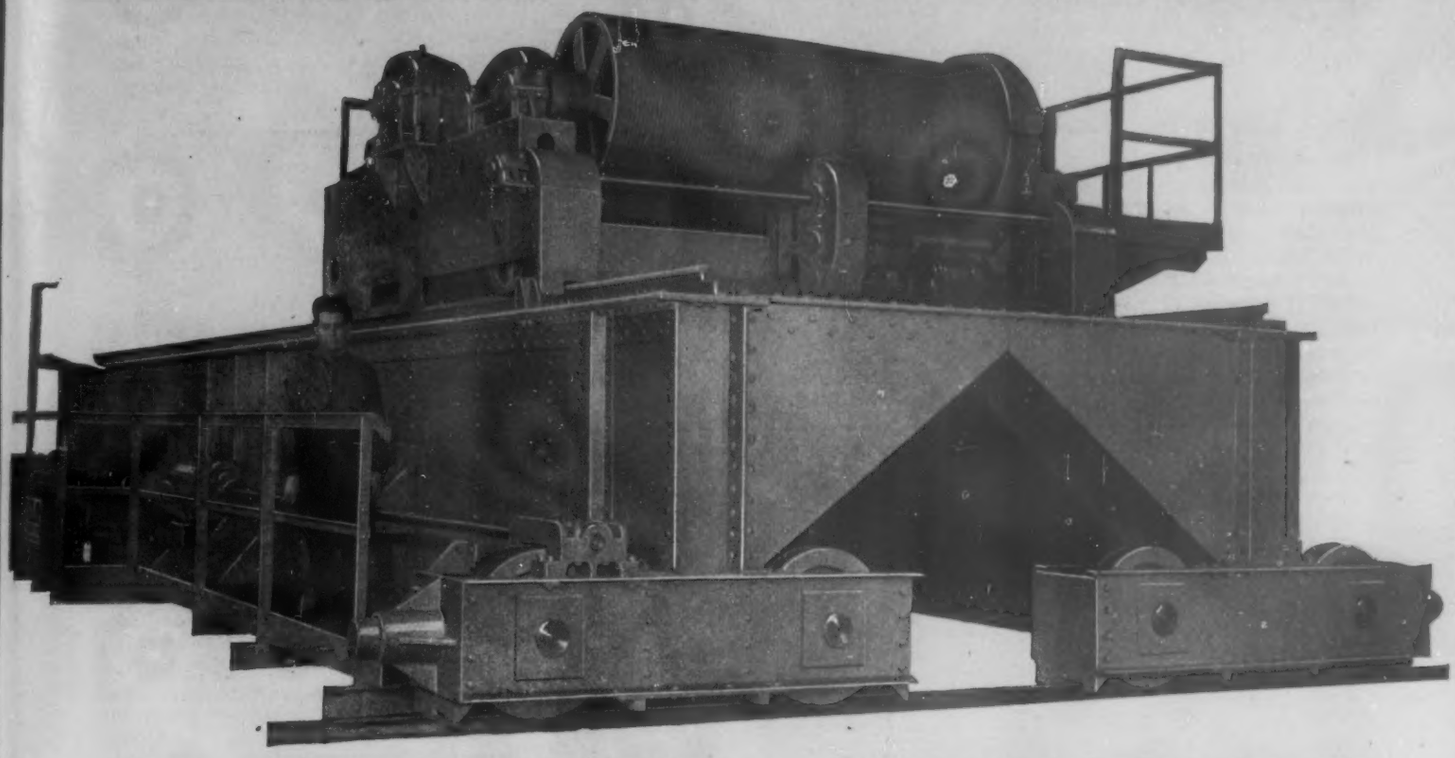


spects its concentricity with the outside diameter. A stop locates the contact point at the desired position in the fuze hole. Entirely mechanical, the gage is said to operate quickly.

Plastic Ear Stopper

Maico Co. Inc., 2632 Nicollet avenue, Minneapolis, is offering a new plastic ear stopper which is said to reduce the detrimental effects of noise upon metal workers. It remains tightly inserted in the ear passage. Molded to individual prescriptions, each stopper is made from impression material applied by a doctor, a dentist of a technician. The mold is then reproduced in transparent plastic. The plastic material used is light in

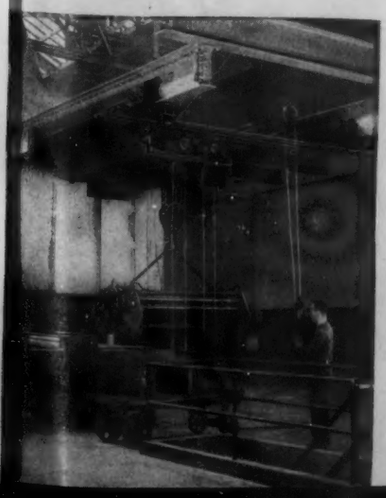
CRITICAL INVESTIGATION



of EUCLID-CRANES *is Invited!*

Write for the EUCLID CRANE Catalog which also describes and illustrates several special cranes as well as the standard line.

Also ask for the Euclid Hoist Catalog No. 838.



SEARCHING investigation of the design, construction and performance of Euclid Cranes is welcomed.

The DESIGN will be found to incorporate conventional features that have met widespread acceptance and approval—plus original improvements developed by Euclid to assure smooth, efficient operation with little maintenance attention.

The CONSTRUCTION is thorough and honest—in structure, machining and assembly.

Extra reinforcement is built into trolley, bridge and end trucks at points of severe stress and the whole crane is constructed to embody maximum strength in proportion to weight. Standard practice calls for a factor of safety of at least 5 to 1.

SATISFACTORY PERFORMANCE is proven by the roll call of Euclid purchasers which includes the leading manufacturers of the country. All are discriminating buyers. Many have placed repeat orders, and an impressive number have standardized on Euclid cranes.

THE EUCLID CRANE & HOIST CO.

EUCLID, OHIO, *Suburb of Cleveland*

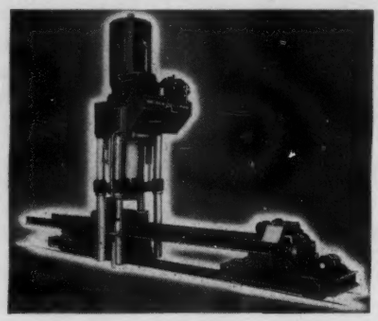
weight, inconspicuous and unbreakable. It has a polished surface which eliminates any irritation when in contact with the ear.

Weld Timer

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has introduced a new SX combination welding timer especially adapted for seam and spot welding where frequent changes of timing are necessary. It consists of a control panel and ignitron tube assembly mounted in a common enclosing cabinet. The ignitrons are essentially mercury arc rectifiers with an ignitron or control electrode inside. Heat of the arc is removed by a water cooling system. Seam weld "on" or "off" timing adjustable from 1 to 30 cycle steps is provided; one to 15 pulsations can be made for each setting. In operating, the electronic tubes and circuits perform five distinct functions: "On" timing; "off" timing; pulsation counting; heat control; and firing of the ignitron power tube.

Straightening Press

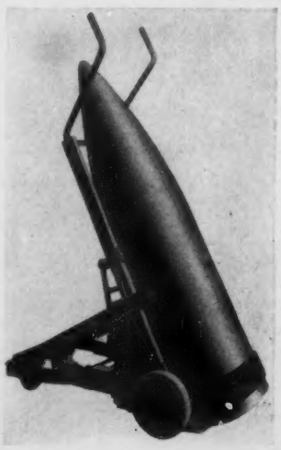
Watson-Stillman Co., Roselle, N. J., has developed a new 1000-ton straightening press, standing some 21 feet high, for straightening shafts from 12 to 18 inches in diameter and from 7 to 60 feet long. One man is capable of handling its entire operation without moving



from a central control panel. The machine, for handling and positioning work, has two sets of rollers, each set mounted on a hydraulic lifting ram which in turn is mounted on a motor-driven carriage running on rails between the columns of the press. One set of rollers is motor-driven to rotate the work. When work is positioned, the lifting rams under the rollers lower it upon two bending blocks. Each of these is independently motor-driven for separation adjustment for 2¼ to 18 feet. The press has a stroke of 38 inches and it features pressing speeds of 470 inches per minute while advancing, 15½ inches per minute while pressing, and 470 inches per minute when returning. Unit's rotary piston, oil type pump is driven by a 50-horsepower motor.

Shell Truck

Lewis-Shepard Sales Corp., 245 Walnut street, Watertown, Mass., has developed a hydraulic-release shell truck for handling large shell in munition plants safely. It is designed so the load pivots around a point near its center of gravity.



This keeps load in balance so that one man can easily raise or lower it. A hydraulic release check cushions movement of the load. The truck also features rubber-tired wheels.

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Murex engineers are generally able to help manufacturers solve perplexing welding problems because of their wide and varied experience in many industries with the welding of many products under all kinds of actual working conditions.

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ARC WELDING ELECTRODES

Helpful Literature

1. Wire Rope

Macwhyte Co.—4-page illustrated bulletin "Ropeology," is regular company publication containing collection of wire rope users' experiences plus science of wire rope application in many classes of service. It carries several articles telling how to care for and prolong life of wire rope slings and cable.

2. Lubricants

D. A. Stuart Oil Co.—20-page illustrated bulletin describes applications of extreme pressure lubricants to industrial equipment. Detailed information is given on these lubricants, describing tests made, testing machines used, and outlining important characteristics of these oils and greases for specific applications.

3. Gate Valve

Bartlett Hayward division, Koppers Co.—4-page bulletin No. 808 presents data on type AR all-iron gate valve in sizes from 4 to 48 inches for water gas plants, coke oven plants, blast furnaces, power plants, chemical plants and similar industrial applications. Cutaway views show design and construction features and indicate principal dimensions. Sketches picture special operating methods.

4. Shims

Laminated Shim Co.—8-page illustrated bulletin gives general information on "Laminum" shims which are composed of brass laminations alternating with layers of metallic binder. Laminations are standard 0.003 or 0.002 inch thick and are readily peeled off to make shim of desired thickness.

5. Pneumatic Vises

Hannifin Manufacturing Co.—4-page illustrated bulletin No. 59 describes four models of pneumatic vises, two for bench and drill press operations and two for milling machine operations. Sectional views indicate operating details, and tables list full specifications. Also described are air control valves and pressure regulating valves.

6. Switching Engine

General Electric Co.—16-page illustrated bulletin GEA-3666 explains design and construction features of 45-ton diesel-electric switching engines. Large close-up photographs point out important construction details and disassembled views show component parts.

7. Fly Ash Elimination

Western Precipitation Corp.—22-page illustrated booklet tells how fly ash can be eliminated by installing "Multiclone" assembly between boiler and stack. Graphs, diagrams, tables of efficiencies, and suggestions on procedure are included.

8. Floodlighting

The Pyle-National Co.—Illustrated catalog No. 2100 contains detailed descriptions, specifications and prices on complete line of floodlights from 10-inch short range types to 36-inch air port types which use 3 or 5 kilowatt lamps. Other models covered include portable floodlights, subway and pit lights, switch engine headlights and accessories.

9. Turret Lathe

G. M. Diehl Machine Works—6-page bulletin contains specifications and description of No. 2 turret lathe which will accept collets up to 1-inch in diameter. Design of spindle, cross slide and turret provide for interchanging of tools with other No. 2 lathes. Engineering drawings show construction features and principal dimensions.

10. Blast Cleaning Barrel

Whiting Corp.—4-page bulletin FY-106 describes "Hydro-Blast" barrel which is specifically designed for cleaning all types of medium and small size foundry castings. Castings of brass, aluminum, magnesium and other non-ferrous metals are cleaned by stream of high-pressure water and sand. Photographs show machine in operation.

11. Foaming Compound

William M. Parkin Co.—4-page folder sets forth features of "Sumfoam" foaming compound for use in pickling solutions. It produces heavy white blanket of foam on surface of pickling solutions which suppresses acid spray and excess steam. In addition compound minimizes acid embrittlement.

12. Machine Drives

Reeves Pulley Co.—18-page illustrated bulletin, "More Power For Defense," shows numerous installations of variable speed transmission, "Vari-Speed" motor pulley, and "Motodrive" in diversified industrial plants. Last mentioned drive combines in one compact enclosure constant speed motor, speed varying mechanism and reduction gears.

13. Radio Telephone

Weltronic Corp.—4-page leaflet T-42 describes portable "Trans-Ceiver" radio telephone which sends and receives messages to distances up to one mile. Instrument can be used for air raid fire spotting, harbor control and piloting, plant to ground and inter-plane communication, scouting reporting, railroad yard operation expediting, and surveying. Operation, range, and construction are discussed.

14. Shapers

General Engineering & Manufacturing Co.—12-page bulletin gives specifications on "Gemco" plain type crank shapers. Full descriptions are enumerated for parts and mechanism comprising machines. Two pages of mechanical drawings show engineering details and principal dimensions.

15. Grinding Wheels

A. P. de Sanno & Son, Inc.—10-page booklet is entitled, "Facts About Por-Os-Way." It tells of grinding wheels custom-made to suit individual requirements, made by special process which imparts to them spongy, porous structure. Seven advantages of wheels are enumerated, together with statements from users.

16. Aircraft Tools

Aero Tool Co.—28-page illustrated catalog lists line of specialized tools for aircraft work. Applications, features sizes, construction and materials are given for rivet sets, squeezer sets, custom made squeezer yokes, bucking bars, plomb bobs, dimple sets, countersinks, drill bushings and sine bars.

17. Die Casting Machines

Phoenix Machine Co.—8-page illustrated bulletin describes "Lester-Phoenix" die casting machines for aluminum, brass, magnesium, zinc, tin and lead base alloys. Features and specifications are tabulated for four models which produce pressures on die metal ranging from 1000 to 22,000 pounds per square inch. Close-up photographs show design and construction details.

18. Grinding Machines

Fitchburg Grinding Machine Corp.—12-page illustrated bulletin deals with type A grinding machine for plain cylindrical grinding. Close-up illustrations show details of construction and design. Detailed specifications are listed.

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19. Protective Coatings

Reilly Tar & Chemical Corp.—10-page illustrated bulletin describes protective coatings for oil and gas transportation lines, and for metal work in water works and sewage plants. Illustrations show applications of coatings for diversified uses. Data is presented on application procedure for various types of coatings.

20. Combustion Instruments

Permutit Co.—20-page bulletin describes "Ranarex" carbon dioxide indicator and recorder, specific gravity indicator and recorder, furnace atmosphere indicator and recorder, and instruments for special applications. Principles of combustion and use of combustion recording instruments are treated extensively.

21. Mobile Electric Plants

Ready-Power Co.—6-page folder No. 522-B mobile electric generating plants for emergency and stand-by service. Plants shown are rated at 100 kilowatts for 60 cycle service and consist of two 50-kilowatt International diesel engined electric plants, complete switchboard, fuel oil storage tank, electric fuel transfer pump, lubricating oil rectifier, starting batteries, station transformer, and both alternating and direct current station lighting system.

22. Abrasives

Sterling Grinding Wheel division, Cleveland Quarries Co.—80-page catalog No. 40-A contains information on grinding wheels. Data cover such matters as wheel breakage and safety tips, abrasives and bonds, standard types of grinding wheels, specifications on various types, shapes and grades of standard and special wheels, and list prices.

23. Pyrometers

Wheelco Instrument Co.—6-page bulletin No. 1 is entitled "Priorities And Pyrometers." It explains to users of temperature measuring and control instruments how defense and war program affects these instruments, their purchase, use, maintenance, and replacements necessary. Properties of original and substitute materials for use in pyrometers are compared.

24. Colloidal Graphite

Acheson Colloids Corp.—4-page bulletin No. A260.5 is one of series of technical bulletins pertaining to application of colloidal graphite to industry. Entitled "Impregnation of Porous Bodies with Colloidal Graphite," bulletin discusses technique employed for impregnation of porous materials with dispersions of colloidal graphite, nature of solid to be impregnated, characteristics of carrier and properties of solution.

25. Springs

Lee Spring Co.—4-page illustrated bulletin lists engineering information on "Scientech" springs. Tabulated are physical specifications, permissible variations, operating factors which govern design and fabricating values, and spring metals. Sketches show typical helical springs and ends.

26. Cranes

Shepard Niles Crane & Hoist Corp.—24-page illustrated bulletin No. 130 describes single beam cranes which are used where conditions do not require nor clearances permit installation of electric traveling crane of double beam construction. Models are shown for operation by push button or pendant rope control from floor, or operator's cable or from remote control.

27. Drill Grinder

William Sellers & Co.—4-page bulletin features No. 1-G drill grinder and cabinet. Machine will grind either straight or tapered shank right hand 2-lip drills, 0.028 to ½-inch diameter, to any angle of point from 65 to 160 degrees.

28. Bearing Covers

R-S Products Corp.—4-page bulletin No. 11-C describes standard covers for ball and roller bearings. They are made of cast iron and have mating surfaces and diameters machined accurately to accepted tolerances. Tables lists available sizes and dimensions, as well as ordering information. Chart shows additional dimensional data.

29. Network Transformers

Westinghouse Electric & Manufacturing Co.—Illustrated bulletin B-3008 discusses secondary net-work transformers for aviation, ordnance and munition plants and oil refineries. Transformers for each system are described, special attention being given to accessibility, safety and maintenance.

30. Air Heaters

Reznor Manufacturing Co.—6-page illustrated bulletin No. AFA41A explains advantages of line of automatic gas fired forced air heaters. Three sizes, with outputs of 22,400, 36,000 and 48,000 British thermal units per hour, are treated extensively with line drawings and photographs.

31. Blast Cleaning Machines

Pangborn Corp.—Illustrated bulletin No. 2012-46-1037 shows series of custom-designed "Rotoblast" cleaning machines installed to fit individual blast cleaning requirements. Essential parts of five installations are depicted in three large automobile plants, a metal chair plant, and a sucker rod plant. Salient features of each installation are briefly explained.

32. Hardfacing Alloys

Wall-Colmonoy Corp.—4-page general catalog No. 72 presents data on "Colmonoy" hard facing alloys and overlay metals, all of which contain patented chromium boride. Application procedure, characteristics and features are given for several grades of product which are applied with electric arc or acetylene torch.

33. Carburizers

Park Chemical Co.—4-page bulletin describes liquid and solid carburizers in grades suitable for all classes of work. Several types of pack carburizers, made with charcoal bases, are described, in addition to carburizing compounds that are used in molten state as salt baths. Compounds for armor plate are also covered.

34. Steam Turbines

Moore Steam Turbine division, Worthington Pump & Machinery Corp.—6-page illustrated bulletin 1955 discusses features of type S multi-stage steam turbines which are available in 15 frames for condensing or non-condensing operations. Cutaway and disassembled views show construction features.

35. Valves

Galland-Henning Manufacturing Co.—16-page illustrated bulletin 84 sets forth features of "Nopak" valves for positive control of air and hydraulic power. Numerous valves are pictured and described in detail. Sketches show standard cycles of operation and dimensions. Prices are included.

36. Porcelain Enamel

Ferro Enamel Corp.—8-page booklet is entitled, "Report of Progress As We Approach 1942." It discusses subjects of physical resources, finances, laboratories, raw material situation, service, engineering, subsidiary plants and future developments. Included is list of personnel in various departments.

37. Flame Cutting

Air Reduction Sales Co.—8-page illustrated bulletin ADC-631 describes type 45 high speed cutting tip which greatly accelerates rate of flame cutting. Performance facts and figures are given in text and chart form. Table of specifications enables buyers to select proper tip for their particular needs.

38. Respirators

H. S. Cover—2-page bulletin describes "Dupor" double filter respirators. Information is given on six models of respirators, in addition to gas-tight, fog-proof rubber goggles. Price schedule for respirators and parts is included.

STEEL *Readers' Service Dept.*

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STEEL

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Readers' Service Dept.

Steel Distribution Plan Being Revamped

Preference ratings became unwieldy. New system gives close control. Scrap supply much improved. Ore fleet ready to load

MARKET IN TABLOID ★

Demand
Heavy at high rating.

Prices
Held under close control.

Production
Increased 2 points to 97½ per cent.

RADICAL changes are under way in the steel distribution system, a specific requirements approach to control replacing general or blanket priority ratings as rapidly as new orders and procedures can be put into effect, giving the War Production Board closer control.

Between April 1 and June 30 most blanket rating orders will be revoked or allowed to expire and consumers will be placed under the Production Requirements Plan. Rapid increase in war requirements renders preference ratings impractical. Under existing orders no exact check on quantities of material has been possible. Under the new plan the Director of Industry Operations will assign ratings for essential use, covering only a specified quantity. Applications will be made covering needs for a quarter, with full information on inventory and end use of products. Interim applications may be made when additional quantities are needed because of increased war production. The change will be made gradually over the three-month period to avoid confusion on deliveries.

Steelworks operations last week reflected better scrap supply and open hearths were relighted after long idleness in several centers. The national production rate advanced 2 points to 97½ per cent, the highest since the first week in January. Buffalo increased 13½ points to 93 per cent, Pittsburgh 2 points to 96, Detroit 10 points to 93, Cincinnati 5 points to 92, eastern Pennsylvania 2 points to 90 and Wheeling 1 point to 82½ per cent. Youngstown lost 1 point to 94 per cent, New England 20 points to 80 per cent and Cleveland 1½ points to 89½ per cent. Chicago held its high rate of 104 per cent, St. Louis was unchanged at 83 per cent and Birmingham steady at 95 per cent.

Decided relief in the scrap situation has resulted from opening of spring weather and increased flow of material from intensive drives on farms, industrial plants and automobile wrecking yards. In a number of consuming centers the increase was marked and it has been possible to relight open hearths that had been idle for many weeks. While some allocated tonnages have been placed to aid distressed consumers, in general all melters are receiving better supply. Apparently the winter shortage has been broken and an easier situation is probable for several months. Scrap from the head of the lakes is expected to move to lower lake ports when navigation is resumed.

War Production Board has taken action to make available scrap material now held back by legal or financial considerations, such as street railway rails, where cost of reclaiming is a deterrent. A conservation board has been set up, with offices in principal cities, which will provide means for financing reclamation. Power of requisition has been granted, in cases where owners do not co-operate fully.

Iron ore carriers entered Lake Superior last week by aid of ice breakers which opened channels through the Straits of Mackinac, the Soo and Whitefish Bay. This is the earliest date in history that movement of ore has started. Limestone cargoes for mills in the Chicago district were loaded last week at Calcite and Port Inland, Mich. The early start promises well for the increased tonnage required for peak steel production.

Plant conversion to war production continues, an increasing number of manufacturers engaging in work more or less remote from their usual line. Some fabricators of aluminum, unable to obtain that metal, are drawing steel cartridge cases, for which their equipment is suited. Some manufacturers normally using forgings and machined parts are turning to stampings, which are more easily obtainable.

Disposal of steel stocks by automobile manufacturers is relieving pressure on mills to some extent, numerous consumers obtaining needed supplies from this source much earlier than from steel mills. Most of this material consists of sheets and bars. It is sold only to consumers with priority ratings, under strict WPB control.

Fabricated structural steel bookings are almost exclusively for war work and in February were the largest since June. For the first two months the total was less than for the same months last year. Fabricators have heavy backlogs for future fabrication. February bookings were 220,205 net tons, shipments 153,732 tons and unfilled tonnage 706,668 tons.

Composite prices of steel and iron products are steady, under ceiling control, finished steel at $56.73, semifinished steel at $36, steelmaking pig iron at $23.05 and steelmaking scrap at $19.17.

COMPOSITE MARKET AVERAGES

	Mar. 28	Mar. 21	Mar. 14	One Month Ago Feb., 1942	Three Months Ago Dec., 1941	One Year Ago Mar., 1941	Five Years Ago Mar., 1937
Finished Steel	$56.73	$56.73	$56.73	$56.73	$56.73	$56.73	$60.14
Semifinished Steel	36.00	36.00	36.00	36.00	36.00	36.00	39.24
Steelmaking Pig Iron	23.05	23.05	23.05	23.05	23.05	23.05	22.10
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	20.15	21.25

Finished Steel Composite:—Average of industry-wide prices on sheets, strip, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Mar. 28, 1942	Feb. 1942	Dec. 1941	Mar. 1941
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.47	2.47	2.47	2.47
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.225
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods No. 5 to ⅜-inch, Pitts.	2.00	2.00	2.00	2.00

Pig Iron

	Mar. 28, 1942	Feb. 1942	Dec. 1941	Mar. 1941
Bessemer, del. Pittsburgh	$25.34	$25.34	$25.34	$25.34
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern, del. Philadelphia	25.34	25.34	25.34	25.34
No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	24.69
No. 2 foundry, Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.38	20.38	20.38	20.38
Southern No. 2, del. Cincinnati	24.06	24.06	24.06	24.06
No. 2X, del. Phila. (differ. av.)	26.215	26.215	26.215	26.215
Malleable, Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	31.34	31.34	31.34	30.34
Gray forge, del. Pittsburgh	24.19	24.19	24.19	24.18
Ferromanganese, del. Pittsburgh	125.63	125.33	125.33	125.33

Scrap

Heavy melting steel, Pitts.	$20.00	$20.00	$20.00	$20.75
Heavy melt. steel, No. 2, E. Pa.	18.75	18.75	18.00	18.65
Heavy melting steel, Chicago	18.75	18.75	18.75	19.45
Rails for rolling, Chicago	22.25	22.25	22.25	24.00
No. 1 cast, Chicago	20.00	20.00	21.20	20.25

Coke

Connellsville, furnace, ovens	$6.25	$6.25	$6.25	$5.50
Connellsville, foundry, ovens	7.25	7.25	7.25	6.00
Chicago, by-product fdry., del.	12.25	12.25	12.25	11.75

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Following are maximum prices established by OPA Schedule No. 6 issued April 16, 1941, revised June 20, 1941 and Feb. 4, 1942. The schedule covers all iron or steel ingots, all semifinished hot-rolled, cold-rolled iron or steel products and any iron or steel product which is further finished by galvanizing, plating, coating, drawing, extruding, etc., although only principal established basing points for selected products are named specifically. All seconds and off-grade products also are covered. Exceptions applying to invidividual companies are noted in the table.

Semifinished Steel

Gross ton basis except wire rods, skelp

Carbon Steel Ingots: F.o.b. mill base, rerolling qual., stand. analysis, $31.00
(Empire Sheet & Tin Plate Co., Mansfield, O., may quote carbon steel ingots at $33 gross ton, f.o.b. mill.)

Alloy Steel Ingots: Pittsburgh base, uncropped, $45.00.

Rerolling Billets, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $34.00; Detroit, del. $36.00; Duluth (bil.) $36.00.
(Wheeling Steel Corp. allocated 21,000 tons 2" square, base grade rerolling billets under lease-lend during first quarter 1942 at $37, f.o.b. Portsmouth, O.; Andrews Steel Co. may quote carbon steel slabs $41 gross ton at established basing points.)

Forging Quality Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $40.00; Detroit, del. $42.00; Duluth, $42.00.
(Andrews Steel Co. may quote carbon forging billets $50 gross ton at established basing points.)

Open Hearth Shell Steel: Pittsburgh, Chicago, base 1000 tons one size and section: 3-12 in., $52.00; 12-18 in., $54.00; 18 in. and over, $56.00.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $54.00.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $34.00.
(Empire Sheet & Tin Plate Co., Mansfield, O., may quote carbon steel sheet bars at $39 gross ton, f.o.b. mill.)

Skelp: Pittsburgh, Chicago, Sparrows Pt., Youngstown, Coatesville, lb., $1.90.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—9/32 in., inclusive, per 100 lbs., $2.00.
Do., over 9/32—47/64-in., incl., $2.15. Worcester add $0.10 Galveston, $0.25. Pacific Coast $0.50 on water shipment.

Bars

Hot-Rolled Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, base 20 tons one size, 2.15c; Duluth, base 2.25c; Detroit, del. 2.25c; New York del. 2.51c; Phila. del. 2.49c; Gulf Ports, dock 2.50c, all-rail 2.59c; Pac. ports, dock 2.80c; all-rail 3.25c.
(Phoenix Iron Co., Phoenixville, Pa., may quote 2.35c at established basing points.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.
(Sweet's Steel Co., Williamsport, Pa., may quote rail steel merchant bars 2.33c f.o.b. mill.

Hot-Rolled Alloy Bars: Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.70c Detroit 2.80c.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	5100 Spr. flats	0.15
2100	0.75	5100 80-1.10 Cr.	0.45
2300	1.70	6100 Bars	1.20
2500	2.55	6100 Spr. flats	0.85
3100	0.70	Carb., Van.	0.85
3200	1.35	9200 Spr. flats	0.15
3300	3.80	9200 Spr. rounds, squares	0.40
3400	3.20	T 1300, Mn, mean 1.51-2.00	0.10
4100 .15-25 Mo. 46.00 .20-.30 Mo. 1.50-2.00; Ni.	0.55 1.20	Do., carbon under 0.20 max.	0.35

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs., 2.65c; Detroit 2.70.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 3.35c; Detroit 3.45c; Galveston, add $0.25, Pacific Coast $0.50.

Turned, Ground Shafting: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras) 2.65c; Detroit 2.70c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base 2.15c; Detroit del. 2.25c; Gulf ports, dock 2.50c, all-rail 2.59c; Pacific ports, dock 2.80c, all-rail 3.25c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, base 2.15c; Detroit, del. 2.25c; Gulf ports, dock 2.50c, all-rail 2.59c; Pacific ports, dock 2.80c, all-rail 3.25c.
(Sweet's Steel Co., Williamsport, Pa., may quote rail steel reinforcing bars 2.33c, f.o.b. mill.

Iron Bars: Single refined, Pitts. 4.40c, double refined 5.40c; Pittsburgh, staybolt, 5.75c; Terre Haute, common, 2.15c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base 2.10c; Granite City, base 2.20c; Detroit del. 2.20c; Phila. del. 2.28c; New York del., 2.35c Pacific ports 2.65c.
(Andrews Steel Co. may quote hot-rolled sheets for shipment to Detroit and the Detroit area on the Middletown, O. base.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.05c; Granite City, base 3.15c; Detroit del. 3.15c; New York del. 3.41c; Phila. del. 3.39c; Pacific ports, 3.70c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.50c; Granite City, base 3.60c; New York del. 3.74c Phila. del. 3.68c; Pacific ports 4.05c.
(Andrews Steel Co. may quote galvanized sheets 3.75c at established basing points.)

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29 gage, per square 3.31c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16 gage, not corrugated, copper alloy 3.60c; copper iron 3.90c, pure iron 3.95c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh 4.25c.

Enameling Sheets: Pittsburgh, Chicago, Gary,

Cleveland, Youngstown, Middletown, 10 gage, base 2.75c; Granite City, base 2.85c; Pacific ports 3.40c.
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 20 gage, base 3.35c; Granite City, base 3.45c; Pacific ports 4.00c.

Electrical Sheets, No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.20c	3.95c	3.30c
Armature	3.55c	4.30c	3.65c
Electrical	4.05c	4.80c	4.15c
Motor	4.95c	5.70c	5.05c
Dynamo	5.65c	6.40c	5.75c
Transformer			
72	6.15c	6.90c	.....
65	7.15c	7.90c	.....
58	7.65c	8.40c	.....
52	8.45c	9.20c	.....

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base, 1 ton and over, 12 inches wide and less 2.10c; Detroit del. 2.20c; Pacific ports 2.75c.
Cold Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less 2.80c; Chicago, base 2.90c; Detroit, del. 2.90c; Worcester base 3.00c.
Commodity C. R. Strip: Pittsburgh, Cleveland, Youngstown, base 3 tons and over, 2.95c; Worcester base 3.35c.
Cold-Finished Spring Steel: Pittsburgh, Cleveland bases, add 20c for Worcester; .26-.50 Carb., 2.80c; .51-.75 Carb., 4.30c; .76-1.00 Carb., 6.15c; over 1.00 Carb., 8.35c.

Tin, Terne Plate

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb. base box, $5.00; Granite City $5.10.
Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29 gage and lighter, 3.05c; Granite City, 3.15c; Pacific ports, boxed 4.05c.
Long Ternes: Pittsburgh, Chicago, Gary, No. 24 unassorted 3.80c.
Manufacturing Ternes: Pittsburgh, Chicago, Gary, 100-base box $4.30; Granite City $4.40.
Roofing Ternes: Pittsburgh base per package 112 sheets, 20 x 28 in., coating I.C., 8-lb. $12.00; 15-lb. $14.00; 20-lb. $15.00; 25-lb. $16.00; 30-lb. $17.25; 40-lb. $19.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.10c; New York, del., 2.30-2.55c; Phila., del., 2.15c; St. Louis, 2.34c; Boston, del., 2.42-67c; Pacific ports, 2.65c; Gulf Ports, 2.45c.
(Central Iron & Steel Co. may quote carbon steel plates at 2.35c at established basing points; Granite City Steel Co. may quote ship plates 2.25c, f.o.b. mill.)
Floor Plates: Pittsburgh, Chicago, 3.35c; Gulf ports, 3.70c; Pacific ports, 4.00c.
Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.50c.
Wrought Iron Plates: Pittsburgh, 3.80c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.10c; New York, del., 2.28c Phila., del., 2.22c; Gulf ports, 2.45c; Pacific ports, 2.75c.
(Phoenix Iron Co., Phoenixville, Pa. may quote carbon steel shapes at 2.30c at established basing points.)
Steel Sheet Piling: Pittsburgh, Chicago, Buffalo, 2.40c.

Wire Products, Nails

Wire: Pittsburgh, Chicago, Cleveland, Birmingham (except spring wire) to manufacturers in carloads (add $2 for Worcester):

Bright basic, bessemer wire	2.60c
Galvanized wire	2.60c
Spring wire	3.20c
Wire Products to the Trade:	
Standard and cement-coated wire nails, polished and staples, 100-lb. keg	$2.55
Annealed fence wire, 100 lb.	3.05
Galvanized fence wire, 100 lb.	3.40
Woven fence, 12½ gage and lighter, per base column	67
Do., 11 gage and heavier	70
Barbed wire, 80-rod spool, col.	70
Twisted barbless wire, col.	70
Single loop bale ties, col.	59
Fence posts, carloads, col.	69
Cut nails, Pittsburgh, carloads	53.85

Pipe, Tubes

Welded Pipe: Base price in carloads to consumers about $200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind. 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Weld

	Steel			Iron	
In.	Blk.	Galv.	In.	Blk.	Galv.
⅛	56	33	½	24	3½
¼ & ⅜	59	40½	¾	30	10
½	63½	51	1-1¼	34	16
¾	66½	55	1½	38	18½
1-3	68½	57½	2	37½	18

Lap Weld

	Steel			Iron	
In.	Blk.	Galv.	In.	Blk.	Galv.
2	61	49½	1¼	23	3½
2½-3	64	52½	1½	28½	10
3½-6	66	54½	2	30½	12
7-8	65	52½	2½, 3½	31½	14½
9-10	64½	52	4	33½	18
11-12	63½	51	4½-8	32½	17
			9-12	28½	12

Boiler Tubes: Net base prices per 100 feet, f.o.b. Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

	—Seamless—			—Lap Weld—	
O. D. Sizes	B.W.G.	Hot Rolled	Cold Drawn	Steel	Charcoal Iron
1"	13	$ 7.82	$ 9.01	.....	.....
1¼"	13	9.26	10.67	.....	.....
1½"	13	10.23	11.72	$ 9.72	$23.71
1¾"	13	11.64	13.42	11.06	22.93
2"	13	13.04	15.03	12.38	19.35
2¼"	13	14.54	16.76	13.79	21.63
2½"	12	16.01	18.45	15.16	.....
2½"	12	17.54	20.21	16.58	26.57
2¾"	12	18.59	21.42	17.54	29.00
3"	12	19.50	22.48	18.35	31.38
3½"	11	24.63	28.37	23.15	39.81
4"	10	30.54	35.20	28.66	49.90
4½"	10	37.35	43.04	35.22	.
5"	9	46.87	54.01	44.25	73.93
6"	7	71.96	82.93	68.14	.

Rails, Supplies

Standard rails, over 60-lb., f.o.b. mill, gross ton, $40.00.
Light rails (billet), Pittsburgh, Chicago, Birmingham, gross ton, $40.00.
*Relaying rails, 35 lbs. and over, f.o.b. railroad and basing points, $28-$30.
Supplies: Angle bars, 2.70c; tie plates, 2.15c; track spikes, 3.00c; track bolts, 4.75c; do. heat treated, 5.00c.

*Fixed by OPA Schedule No. 46, Dec. 15, 1941.

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, base, cents per lb.: Reg. carbon 14.00c; extra carbon 18.00c; special carbon 22.00c; oil-hardening 24.00c; high car.-chr. 43.00c.
High Speed Tool Steels:

Tung.	Chr.	Van.	Moly.	Pitts. base, per lb.
18.00	4	1	..	67.00c
18.00	4	2	1	77.00c
18.00	4	3	1	87.00c
1.5	4	1	8.5	54.00c
.....	4	2	8	54.00c
5.50	4	1.50	4	57.50c
5.50	4.50	4	4.50	70.00c

Stainless Steels

Base, Cents per lb.—f.o.b. Pittsburgh

Type	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
CHROMIUM NICKEL STEEL					
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
308	29.00	34.00	41.00	28.50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	48.75	56.00
311	49.00	52.00	53.00	48.75	56.00
312	36.00	40.00	49.00	..	..
*316	40.00	44.00	48.00	40.00	48.00
*317	50.00	54.00	58.00	50.00	58.00
†321	29.00	34.00	41.00	29.25	38.00
‡347	33.00	38.00	45.00	33.00	42.00
431	19.00	22.00	29.00	17.50	22.50
STRAIGHT CHROMIUM STEEL					
403	21.50	24.50	29.50	21.25	27.00
**410	18.50	21.50	26.50	17.00	22.00
416	19.00	22.00	27.00	18.25	23.50
††420	24.00	28.50	33.50	23.75	36.50
430	19.00	22.00	29.00	17.50	22.50
‡‡430F	19.50	22.50	29.50	18.75	24.50
442	22.50	25.50	32.50	24.00	32.00
446	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502	9.00	13.00	16.75	13.00	18.00
STAINLESS CLAD STEEL (20%)					
304	.....	§§18.00	19.00	.....	.....

*With 2-3% moly. †With titanium. ‡With columbium. **Plus machining agent. ††High carbon. ‡‡Free machining. §§Includes annealing and pickling.

Basing Point Prices are (1) those announced by U. S. Steel Corp. subsidiaries for first quarter of 1941 or in effect April 16, 1941 at designated basing points or (2) those prices announced or customarily quoted by other producers at the same designated points. Base prices under (2) cannot exceed those under (1) except to the extent prevailing in third quarter of 1940.
Extras mean additions or deductions from base prices in effect April 16, 1941.
Delivered prices applying to Detroit, Eastern Michigan, Gulf and Pacific Coast points are deemed basing points except in the case of the latter two areas when water transportation is not available, in which case nearest basing point price plus all-rail freight may be charged.
Domestic Ceiling prices are the aggregate of (1) governing basing point price, (2) extras and (3) transportation charges to the point of delivery as customarily computed. **Governing basing point** is basing point nearest the consumer providing the lowest delivered price. **Emergency basing point** is the basing point at or near the place of production or origin of shipment.
Dislocated tonnage: Producers shipping material outside their usual marketing areas because of the war emergency may charge the basing point price nearest place of production plus actual cost of transportation to destination.
Seconds or off-grade iron or steel products cannot be sold at delivered prices exceeding those applying to material of prime quality.
Export ceiling prices may be either the aggregate of (1) governing basing point or emergency basing point (2) export extras (3) export transportation charges provided they are the f.a.s. seaboard quotations of the U. S. Steel Export Co. on April 16, 1941. Domestic or export extras may be used in case of Lease-Lend tonnage.

Bolts, Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%.

Carriage and Machine

½ x 6 and smaller	65½ off
Do., ⅝ and ⅝ x 6-in. and shorter	63½ off
Do., ¾ to 1 x 6-in. and shorter	61 off
1⅛ and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off

Stove Bolts

In packages with nuts separate 71-10 off; with nuts attached 71 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	56 off
Plow bolts	65 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
½-inch and less	62	64
⅝-1-inch	59	60
1⅛-1½-inch	57	58
1⅝ and larger	56	..

Hexagon Cap Screws

Upset 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	68 off
Headless, ¼-in., larger	55 off
No. 10, smaller	60 off

Piling

Pittsburgh, Chicago, Buffalo 2.40c

Rivets, Washers

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham

Structural	3.75c
⅞-inch and under	65-5 off
Wrought washers, Pittsburgh, Chicago, Philadelphia, to jobbers and large nut, bolt manufacturers l.c.l.	$2.75-3.00 off

Metallurgical Coke

Price Per Net Ton

Beehive Ovens	
Connellsville, furnace	$6.00
Connellsville, foundry	7.00- 7.50
Connellsville prem. fdry.	7.25- 7.60
New River, foundry	8.00- 8.25
Wise county, foundry	7.50
Wise county, furnace	6.50
By-Product Foundry	
Kearny, N. J., ovens	12.15
Chicago, outside delivered	11.50
Chicago, delivered	12.25
Terre Haute, delivered	12.00
Milwaukee, ovens	12.25
New England, delivered	13.75
St. Louis, delivered	12.25
Birmingham, ovens	8.50
Indianapolis, delivered	12.00
Cincinnati, delivered	11.75
Cleveland, delivered	12.30
Buffalo, delivered	12.50
Detroit, delivered	12.25
Philadelphia, delivered	12.38

Coke By-Products

Spot, gal., freight allowed east of Omaha	
Pure and 90% benzol	15.00c
Toluol, two degree	28.00c
Solvent naphtha	27.00c
Industrial xylol	27.00c
Per lb. f.o.b. works	
Phenol (car lots, returnable drums)	12.50c
Do. less than car lots	13.25c
Do. tank cars	11.50c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls. to jobbers	8.00c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$29.00

Pig Iron

Prices (in gross tons) are maximums fixed by OPA Price Schedule No. 10, effective June 10, 1941. Exceptions indicated in footnotes. Allocation regulations from WPB Order M-17, expiring Dec. 31, 1942. Base prices bold face, delivered light face.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$25.00	$24.50	$26.00	$25.50
Newark, N. J., del.	26.62	26.12	27.62	27.12
Brooklyn, N. Y., del.	27.65	.....	.....	28.15
Birdsboro, Pa., del.	25.00	24.50	26.00	25.50
Birmingham, base	†20.38	†19.00	.....	.....
Baltimore, del.	25.67	24.79	.....	.....
Boston, del.	25.12	..	.....	.....
Chicago, del.	†24.22	..	.....	.....
Cincinnati, del.	24.30	22.84	.....	.....
Cleveland, del.	24.12	23.24	..	...
Newark, N. J., del	26.24	...	.....	.....
Philadelphia, del.	25.51	24.63	.....	.....
St. Louis, del.	†24.12	23.24	.....	...
Buffalo, base	24.00	23.00	25.00	24.50
Boston, del.	25.50	25.00	26.50	26.00
Rochester, del.	25.53	.....	26.53	26.03
Syracuse, del.	26.08	.....	27.08	26.58
Chicago, base	24.00	23.50	24.50	24.00
Milwaukee, del.	25.17	24.67	25.67	25.17
Muskegon, Mich., del.	27.38	26.88	27.88	27.38
Cleveland, base	24.00	23.50	24.50	24.00
Akron, Canton, O., del.	25.47	24.97	25.97	25.47
Detroit, base	24.00	23.50	24.50	24.00
Saginaw, Mich., del.	26.45	25.95	26.95	26.45
Duluth, base	24.50	...	25.00	24.50
St. Paul, del.	26.76	.....	27.26	26.76
Erie, Pa., base	24.00	23.50	25.00	24.50
Everett, Mass., base	25.00	24.50	26.00	25.50
Boston	25.50	25.00	26.50	26.00
Granite City, Ill., base	24.00	23.50	24.50	24.00
St. Louis, del.	24.50	24.00	.....	24.50
Hamilton, O., base	24.00	23.50	...	24.00
Cincinnati, del.	24.68	24.68	.....	25.35
Neville Island, Pa., base	24.00	23.50	24.50	24.00
§Pittsburgh, del., No. & So. sides	24.69	24.19	25.19	24.69
Provo, Utah, base	22.00	...	...	...
Sharpsville, Pa., base	24.00	23.50	24.50	24.00
Sparrows Point, Md., base	25.00	24.50	..	...
Baltimore, del.	26.05	...	.....	...
Steelton, Pa., base	..	24.50	...	25.50
Swedeland, Pa., base	25.00	24.50	26.00	25.50
Philadelphia, del.	25.89	25.39	..	26.39
Toledo, O., base	24.00	23.50	24.50	24.00
Mansfield, O., del.	26.06	25.56	26.56	26.06
Youngstown, O., base	24.00	23.50	24.50	24.00

*Basic silicon grade (1.75-2.25%), add 50c for each 0.25%. †For phosphorous 0.70 and over deduct 38c. ‡Over 0.70 phos. §For McKees Rocks, Pa., add .55 to Neville Island base; Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa, .84; Monessen, Monongahela City .97 (water); Oakmont, Verona 1.11; Brackenridge 1.24.

High Silicon, Silvery

6.00-6.50 per cent (base)	$29.50		
6.51-7.00	$30.50	9.01- 9.50	$35.50
7.01-7.50	31.50	9.51-10.00	36.50
7.51-8.00	32.50	10.01-10.50	37.50
8.01-8.50	33.50	10.51-11.00	38.50
8.51-9.00	34.50	11.01-11.50	39.50

F.o.b. Jackson county, O., per gross ton, Buffalo base prices are $1.25 higher. Prices subject to additional charge of 50 cents a ton for each 0.50% manganese in excess of 1.00%.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton. (For higher silicon irons a differential over and above the price of base grades is charged as well as for the hard chilling irons, Nos. 5 and 6.)

Charcoal Pig Iron

Northern

Lake Superior Furn.	$28.00
Chicago, del.	31.34

Southern

Semi-cold blast, high phos., f.o.b. furnace, Lyles, Tenn.	$28.50
Semi-cold blast, low phos., f.o.b furnace, Lyles, Tenn.	33.00

Gray Forge

Neville Island, Pa.	$23.50
Valley, base	23.50

Low Phosphorus

Basing points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $29.50 base; $30.81, delivered, Philadelphia.

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differentials: Basing point prices are subject to an additional charge not to exceed 50 cents a ton for each 0.25 silicon in excess of base grade (1.75 to 2.25%).

Phosphorous Differential: Basing point prices are subject to a reduction of 38 cents a ton for phosphorous content of 0.70% and over.

Manganese Differentials: Basing point prices subject to an additional charge not to exceed 50 cents a ton for each 0.50% manganese content in excess of 1.0%.

Ceiling prices are the aggregate of (1) governing basing point (2) differentials (3) transportation charges from governing basing point to point of delivery as customarily computed. Governing basing point is the one resulting in the lowest delivered price for the consumer.

Exceptions to Ceiling Prices: Pittsburgh Coke & Iron Co. (Sharpsville, Pa. furnace only) and Struthers Iron & Steel Co. may charge 50 cents a ton in excess of basing point prices for No. 2 Foundry, Basic, Bessemer and Malleable.

Export Prices: In case of exports only, the governing basing point nearest point of production may be used, plus differentials and export transportation charges.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	38.00
New Jersey	49.00

Ohio

First quality	43.00
Intermediate	36.10
Second quality	36.00

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	58.90
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$31.00
Wire cut	29.00

Magnesite

Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00

Fluorspar

Washed gravel, duty pd., tide, net ton	nominal
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$25.00
Do., barge	25.00
No. 2 lump	25.00

Ferroalloy Prices

Ferromanganese, 78-82%, Carlots, duty pd., seab'd $120.00; Carlots, del. Pittsburgh 125.63; Carlots, f.o.b. So. f'ces. 140.00. Add $10 for ton, $13.50 for less ton, $18 for less than 200-lb. lots.

Spiegeleisen, 19-21%, gross ton, Palmerton $36.00

Manganese Briquets, Contract carloads, bulk freight allowed, per lb. 5.50c; Packed 5.75c; Ton lots 6.00c; Less-ton lots 6.25c; Less 200-lb. lots 6.50c. Spot ¼c higher.

Manganese Electro, 99.9+%, less car lots 42.00c

Chromium Metal, per lb. contained chromium

	Contract	Spot
98% Cr. ton lots	80.00c	85.00c
88% Cr. ton lots	79.00c	84.00c

Ferrocolumbium, 50-60% f.o.b. Niagara Falls, per lb. contained Cb on contract $2.25; Less-ton lots 2.30. (Spot 10c higher)

Chromium Briquets, per lb., freight allowed

	Contract	Spot
Carlots	8.25c	8.50c
Packed	8.50c	8.75c
Ton lots	8.75c	9.00c
Less-ton lots	9.00c	9.25c
Less 200 lbs.	9.25c	9.50c

Ferrochrome, 66-70%, freight allowed, 4-6% carbon, per pound contained (chrome) Carloads 13.00c; Ton lots 13.75c; Less-ton lots 14.00c

Less than 200-lb. lots 14.25c

67-72%, low carbon, cts. per pound:

	Car loads	Ton lots	Less ton	Less 200 lbs.
2% C.	19.50	20.25	20.75	21.00
1% C.	20.50	21.25	21.75	22.00
0.20% C.	21.50	22.25	22.75	23.00
0.10% C.	22.50	23.25	23.75	24.00

Spot is ¼c higher.

Ferromolybdenum, 55-75%, per lb. contained molybdenum, f.o.b. furnace 95.00c

Calcium Molybdate (Molyte), 40-45% Mo., per lb. contracts, f.o.b. producers plant 80.00c

Molybdic Oxide Briquets, 48-52% Mo. per lb. contained, f.o.b. producers plant 30.00c

Molybdenum Oxide, (In 5 and 20 lb. mo. contained cans) 53-63 mo. per lb. contained f.o.b. producers' plants 80.00c

Molybdenum Powder, 99%, f.o.b. York, Pa., per lb. in 200-lb. kegs $2.60; Do., 100-200 lb. lots 2.75; Do., under 100-lb. lots 3.00

Ferrophosphorus, 17-19%, gross ton carloads, f.o.b. sellers' works, $3 unitage, freight equalized with Rockdale, Tenn. for 18% phos.

Contract	$58.50
Spot	62.25

23-26%, $3 unitage, freight equalized with Mt. Pleasant, Tenn., for 24% phos.

Contract	75.00
Spot	80.00

Ferrosilicon, Gross tons, freight allowed, bulk

	Carloads	Ton lots
50%	$ 74.50	$87.00
Unitage	1.50	1.75
75%	135.00	151.00
Unitage	1.80	2.00
85%	170.00	188.00
Unitage	2.00	2.20
90-95%	10.25c	11.25c

(Above for contracts; spot ¼c higher)

Silicon Metal, Spot ¼-cent higher (Per Lb., Contracts):

	1% Iron	2% Iron
Carlots	14.50c	13.00c
Ton lots	15.00c	13.50c
Less-ton lots	15.25c	13.75c
Less 200 lbs.	15.50c	14.00c

Silicon Briquets, Contract carloads, bulk freight allowed, per ton $74.50; Packed 80.50; Ton lots 84.50; Less-ton lots, per lb. 4.00c; Less 200-lb. lots 4.25c. Spot ¼c higher on less ton lots; $5 higher on ton lots and over.

Silicomanganese,

Carbon	1½%
Carloads (contract)	$128.00
Ton Lots (contract)	140.50

Freight allowed spot $5 above contract

Ferrotungsten, (All prices nominal) Carlots, per lb. contained tungsten $1.90

Tungsten Metal Powder, (Prices Nominal) 98-99 per cent. per pound, depending upon quantity $2.55-$2.65

Ferrotitanium, 40-45%, f.o.b. Niagara Falls, per lb. contained in ton lots $1.23

Less ton lots 1.25

20-25%, C. 0.10 max., in ton lots per lb. contained Ti 1.35; Less-ton lots 1.40 (Spot 5c higher)

Ferro-Carbon-Titanium, 15-20% Titanium,

	6-8% C	3-5% C
Carlots, contract, f.o.b. Niagara Falls, freight allowed to destinations east of Mississippi and north of Baltimore and St. Louis	$142.50	$157.50

Ferrovanadium, 35-40%, contract per pound contained vanadium $2.70-$2.80-$2.90 (Spot 10c higher)

Vanadium Pentoxide, Per lb. contained, contracts $1.10; Do., spot 1.15

Zirconium Alloy, 12-15%, carloads, contract, bulk $102.50; Packed 107.50; Ton lots 108.00; Less ton lots 112.50. Spot $5 a ton higher

35-40%, contract, carloads, bulk or package, per lb. alloy 14.00c; Do., ton lots 15.00c; Do., less-ton lots 16.00c. Spot is ¼-cent higher

Alsifer, Per lb., f.o.b. Niagara Falls.

	Contract	Spot
Carlots	7.50c	8.00c
Ton lots	8.00c	8.50c

Simanal, Per lb. of alloy, contracts, freight allowed (approx. 20% Si, 20% Mn, 20% Al)

Carlots	Ton Lots	Less Ton Lots
10.50c	11.00c	11.50c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials. As of April 16, 1941

	Soft Bars	Hot-rolled Strip Bands	Hot-rolled Strip Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled	Sheets Cold Rolled	Sheets Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars Carbon	Cold Drawn Bars S.A.E. 2300	Cold Drawn Bars S.A.E. 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.68	5.11	3.46	4.13	8.88	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.00	3.51	4.09	8.84	7.19
Philadelphia	3.85	3.95	4.45	3.55	3.55	5.25	3.55	4.05	4.65	3.31	4.06	8.56	7.16
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	....	5.05	....	4.04	....	....
Norfolk, Va.	4.00	4.10	....	4.05	4.05	5.45	3.85	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.25	4.30	4.75	3.52	3.75	8.40	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.65	....	3.65	8.40	6.75
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.62	3.20	3.75	8.40	6.75
Detroit	3.43	3.43	3.68	3.60	3.65	5.27	3.43	4.30	4.84	3.40	3.80	8.70	7.05
Omaha	4.10	4.20	4.20	4.15	4.15	5.75	3.85	5.32	5.50	....	4.42	....	....
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.37	4.92	3.45	4.00	8.75	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.25	4.10	4.85	3.50	3.75	8.40	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.50	4.35	5.00	3.83	4.34	9.09	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.38	4.23	4.98	3.54	3.88	8.38	6.98
St. Louis	3.64	3.74	3.74	3.69	3.69	5.29	3.39	4.24	4.99	3.61	4.02	8.77	7.12
Indianapolis	3.60	3.75	3.75	3.70	3.70	5.30	3.45	....	5.01	....	3.97	....	....
Chattanooga*	3.80	4.00	4.00	3.85	3.85	5.80	3.75	....	4.50	....	4.39	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	.	5.25	.	4.31	.	.
Birmingham	3.50	3.70	3.70	3.55	3.55	5.93	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	5.25	5.00	4.60	....	....
Houston, Tex.	3.75	4.30	4.30	4.05	4.05	5.50	4.00	....	5.25	....	6.90	....	....
Seattle	4.35	4.35	.	4.35	4.35	6.10	4.35	6.35	5.60	....	5.75	....	....
Los Angeles	4.50	4.95	6.80	4.50	4.50	6.75	4.65	6.50	5.85	....	6.10	10.55	9.55
San Francisco	4.10	4.60	6.35	4.25	4.25	5.95	4.25	6.40	6.00	....	6.80	10.80	9.80

*Not named in OPA price order.

	S.A.E. Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.56	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.35	5.65	5.40	7.50
Pittsburgh	3.40	7.45	5.75	5.50	7.60
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.69	5.99	5.74	7.84
Chicago	3.70	7.35	5.65	5.40	7.50
Twin Cities	3.95	7.70	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.84	7.72	6.02	5.77	7.87
Seattle	6.25	....	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	8.80
San Francisco	5.60	9.80	8.80	8.65	9.05

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland; 300-9999 Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in B'ham., Memphis.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Omaha, Kansas City, St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Seattle; any quantity in Twin Cities, New Orleans; 300-1999 Los Angeles.

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-4999 in Portland, Seattle; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 3500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Philadelphia; 750-4999 in San Francisco.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 500-999, Los Angeles, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

EUROPEAN IRON, STEEL PRICES

Dollars at $4.02½ per Pound Sterling

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	Gross Tons	BRITISH U.K. Ports £ s d
Merchant bars, 3-inch and over	$66.50	16 10 0
Merchant bars, small, under 3-inch, re-rolled	3.60c	20 0 0
Structural shapes	2.95c	15 10 0
Ship plates	2.90c	16 2 6
Boiler plates	3.17c	17 12 6
Sheets, black, 24 gage	4.00c	22 5 0
Sheets, galvanized, corrugated, 24 gage	4.61c	25 12 6
Tin plate, base box, 20 x 14, 108 pounds	$ 6.20	1 10 9

British ferromanganese $120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices Delivered at Works or Furnace—

		£ s d
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$25.79	6 8 0(a)
Basic pig iron	24.28	6 0 6(a)
Furnace coke, f.o.t. ovens	7.56	1 17 6
Billets, basic soft, 100-ton lots and over	49.37	12 5 0
Standard rails, 60 lbs. per yard, 500-ton lots & over	2.61c	14 10 6
Merchant bars, rounds and squares, under 3-inch	3.17c	17 12 0††
Shapes	2.77c	15 8 0††
Ship plates	2.91c	16 3 0††
Boiler plates	3.06c	17 0 6††
Sheets, black, 24 gage, 4-ton lots and over	4.10c	22 15 0
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over	4.70c	26 2 6
Plain wire, mild drawn, catch weight coils, 2-ton lots and over	4.28c	23 15 0
Bands and strips, hot-rolled	3.30c	18 7 0

(a) del. Middlesbrough 5s rebate to approved customers. ††Rebate 15s on certain conditions.

Ores

Lake Superior Iron Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract	12.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos.	Nom.
Spanish, No. African basic, 50 to 60%	Nom.
Chinese wolframite, net ton, duty pd.	$24.00
Brazil iron ore, 68-69% ord.	7.50c
Low phos. (.02 max.) F.O.B. Rio Janeiro.	8.00c
Scheelite, imp.	23.50-24.00

Chrome Ore

Gross ton c.i.f. Baltimore; dry basis; subject to penalties for guarantees

Indian and African, 2.8:1 lump, 48%	$39.00
South African (excluding war risk) No ratio lump, 44%	28.00
Do. 45%	29.00
Do. 48%	34.00
Do. concentrates, 48%	33.00
Do. 50%	34.00
Brazilian (nominal) 2.5:1 lump, 44%	31.00
2.8:1 lump, 44%	32.50
3:1 lump, 48%	41.00
No ratio lump, 48%	35.00-35.50
Do. concentrate, 48%	33.00-33.50
Philippine (nominal) No ratio lump, 45%	32.00
2.8:1 lump, 48%	40.00
Do., concentrate, 48%	39.00
2.5:1 concentrate, 48%	36.50
No ratio concentrate, 48%	34.00
No ratio lump, 48%	35.00
Rhodesian	nominal

Manganese Ore

Including war risk but not duty, cents per unit cargo lots

Caucasian, 50-52%	
S. African, 48%	65.00
Indian, 50%	66.00
Brazilian, 48%	
Chilean, 48%	
Cuban, 51%, duty free	83.00-85.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

MAXIMUM PRICES FIXED BY OPA ON IRON AND STEEL SCRAP

Other than railroad grades quoted on the basis of basing point prices from which shipping point prices and consumers' delivered prices are to be computed. Scrap originating from railroads quoted delivered to consumers' plants located on the line of the railroad from which the material originated. All prices in gross tons. A basing point includes its switching district.

PRICES FOR OTHER THAN RAILROAD SCRAP

				ELECTRIC FURNACE AND FOUNDRY GRADES										
				Low Phos. Grades										
	OPEN HEARTH GRADES*	Machine Shop Turnings	BLAST FURNACE GRADES*	Billet, Bloom Forge Crops	Bar Crops and smaller; Punchings, Plate	Heavy Structural, Plate 3 ft. and less	Heavy Structural, Plate 2 ft. and less	Heavy Structural, Plate 1 ft. and less	Cut Auto Scrap 3 ft. and less	Cut Auto Scrap 2 ft. and less	Cut Auto Scrap 1 ft. and less	Alloy-Free Low Phos. & Sulphur Turnings	First Cut Heavy Axle & Forge Turnings	Electric Furnace Bundles
Pittsburgh, Brackenridge, Butler, Johnstown, Midland, Monessen, Sharon, Steubenville, Weirton, Canton, Youngstown, Warren	$20.00	$16.00	$16.00	$25.00	$22.50	$21.00	$21.50	$22.00	$20.00	$20.50	$21.00	$18.00	$19.50	$21.00
Claymont, Coatesville, Harrisburg, Conshohocken, Phoenixville	18.75	14.75	14.75	23.75	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75
Bethlehem	18.25	14.25	14.25	23.25	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25
Buffalo	19.25	15.25	15.25	24.25	21.75	20.25	20.75	21.25	19.25	19.75	20.25	17.25	18.75	20.25
Cleveland, Middletown, Cincinnati, Portsmouth, Ashland	19.50	15.50	15.50	24.50	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50
Detroit	17.85	13.85	13.85	22.85	20.35	18.85	19.35	19.85	17.85	18.35	18.85	15.85	17.35	18.85
Toledo		13.85	13.85											
Chicago	18.75	14.75	14.75	23.75	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75
Kokomo	18.25	14.25	14.25	23.25	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25
Duluth	18.00	14.00	14.00	23.00	20.50	19.00	19.50	20.00	18.00	18.50	19.00	16.00	17.50	19.00
St. Louis	17.50	13.50	13.50	22.50	20.00	18.50	19.00	19.50	17.50	18.00	18.50	15.50	17.00	18.50
Birmingham, Atlanta, Alabama City, Los Angeles, San Francisco, Pittsburg, Calif.	17.00	13.00	13.00	22.00	19.50	18.00	18.50	19.00	17.00	17.50	18.00	15.00	16.50	18.00
Minnequa, Colo.	16.50	12.50	12.50	21.50	19.00	17.50	18.00	18.50	16.50	17.00	17.50	14.50	16.00	17.50
Seattle	14.50	10.50	10.50	19.50	17.00	15.50	16.00	16.50	14.50	15.00	15.50	12.50	14.00	15.50
Portland, Oreg.					15.50	14.00	14.50	15.00	13.00	13.50	14.00	11.00	12.50	14.00

RAILROAD SCRAP

	Heavy Melting Steel	Scrap Rails	Rails for Rolling	Scrap Rails 3 ft. and under	Scrap Rails 2 ft. and under	Scrap Rails 18 in. and under
Pittsburgh, Wheeling, Steubenville, Sharon, Youngstown, Canton	21.00	22.00	23.50	24.00	24.25	24.50
Philadelphia, Wilmington, Sparrows Point	19.75	20.75	22.25	22.75	23.00	23.25
Cleveland, Cincinnati, Middletown, Ashland, Portsmouth	20.50	21.50	23.00	23.50	23.75	24.00
Chicago	19.75	20.75	22.25	22.75	23.00	23.25
Buffalo	20.25	21.25	22.75	23.25	23.50	23.75
Detroit	18.85	19.85	21.35	21.85	22.10	22.35
Kokomo	19.25	20.25	21.75	22.25	22.50	22.75
Duluth	19.00	20.00	21.50	22.00	22.25	22.50
Kansas City, Mo.	17.00	18.00	19.50	20.00	20.25	20.50
St. Louis	18.50	19.50	21.00	21.50	21.75	22.00
Birmingham	18.00	19.00	20.50	21.00	21.25	21.50
Los Angeles, San Francisco	18.00	19.00	20.50	21.00	21.25	21.50
Seattle	15.50	16.50	18.00	18.50	18.75	19.00

CAST IRON SCRAP OTHER THAN RAILROAD

(Shipping point prices in gross tons)

	Group A	Group B	Group C
No. 1 Cupola Cast	$18.00	$19.00	$20.00
No. 1 Machinery Cast, Drop Broken, 150 lbs. & Under	18.00	19.00	20.00
Clean Auto Cast	18.00	19.00	20.00
Stove Plate	17.00	18.00	19.00
Unstripped Motor Blocks	17.50	18.50	19.50
Heavy Breakable Cast	15.50	16.50	17.50
Charging Box Size Cast	17.00	18.00	19.00
Miscellaneous Malleable	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C includes states not named in groups A and B, plus Kansas City, Kans.-Mo.

*Open Hearth Grades refer to No. 1 heavy melting steel, No. 1 hydraulic compressed black sheet scrap, No. 2 heavy melting steel, dealers' No. 1 bundles, dealers' No. 2 bundles and No. 1 busheling. **Blast Furnace Grades** refer to mixed borings and turnings, shoveling turnings, No. 2 busheling and cast iron borings. Add $3 for chemical borings. $5 when chemical borings used in manufacture of explosives.

A basing point includes the switching district of the city named. The Pittsburgh basing point includes the switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport, Pa. Cincinnati basing point includes the switching district of Newport, Ky. St. Louis basing point includes the switching districts of Granite City, East St. Louis and Madison, Ill. San Francisco basing point includes the switching districts of South San Francisco, Niles and Oakland, Calif.

Inferior Grades: Maximum prices of inferior grades shall continue to bear the same differential below the corresponding listed grades as existed from Sept. 1, 1940, to Jan. 31, 1941. No premium allowed on grades considered superior, unless approved by OPA. Addition of special preparation charges prohibited. Purchase of electric furnace or foundry grades for open hearth or blast furnace use permitted only at no more than price for corresponding open hearth grade. Exceptions: Low phos. billet, bloom and forge crops and electric furnace bundles may exceed open hearth price, and electric furnace bundles may exceed blast furnace price, if material is delivered to the consumer direct from the original industrial producer.

Commissions: No commission is payable except by a consumer to a broker for services rendered, the commission not to exceed 50 cents per gross ton. No commission is payable unless: The broker guarantees the quality and delivery of an agreed tonnage the scrap is purchased at a price no higher than the maximum allowed; the broker sells the scrap to the consumer at the same price at which he purchased it; the broker does not split the commission with the seller of the scrap, with another broker or sub-broker, or with the consumer. Commissions must be shown as separate item on invoice.

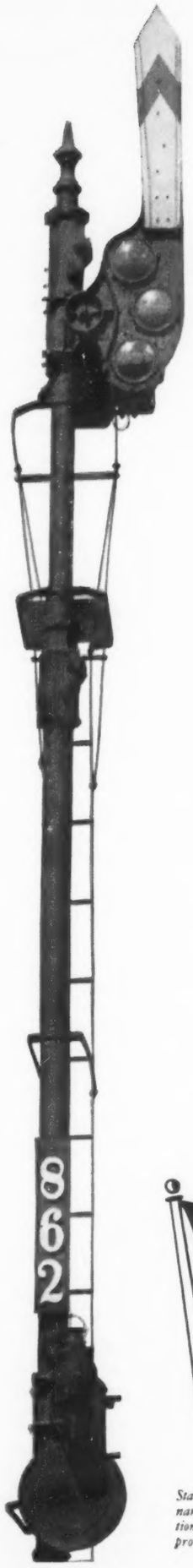
Maximum Shipping Point Price: Where shipment to consumer is by rail, vessel or combination of both, scrap is at its shipping point when it has been placed f.o.b. railroad car or f.a.s. vessel. In such cases, maximum shipping point prices are: (1) For shipping points located within a basing point, the price listed in the above table for scrap at the basing point in which the shipping point is located minus the lowest established switching charge for scrap within the basing point; and (2) for shipping points located outside a basing point, the price in the above table for scrap at the most favorable basing point, minus the lowest transportation charge by rail, water or combination thereof. When vessel movement is involved, dock charges shall be 50 cents at Memphis, $1 at Great Lakes ports, $1.25 at New England ports, 75 cents elsewhere. New England shipping point prices computed on most favorable basing point prices; maximum transportation charge on scrap from New England, $6.65 per ton.

Scrap shipped by motor vehicle is at its shipping point when loaded. For shipping points within basing points, maximum is price listed in table minus lowest switching charge. When outside basing point, maximum is price at most favorable basing point minus lowest established charge when hauled by common carrier. When hauled by seller charges are based on carload rate for rail shipment, minimum $1.00 per ton.

Maximum Delivered Prices: Determined by adding established transportation charges to shipping point price, not to exceed by more than $1 (plus freight rate increase March 18, 1942) the prices listed in the table for the nearest basing point. Certain exceptions specified in Revised Price Schedule No. 4 (Amendment 1) apply to St. Louis district consumers, to WPB allocations, to water shipments from Duluth or Superior, Wis., to shipments of billets, blooms and forge crops from Pittsburgh and to shipments of electric and foundry grades from Michigan; to shipments of turnings to ferroalloy producers and of borings to chemical users. Delivered prices of scrap shipped under WPB allocations may exceed prices at nearest basing point by more than $1, provided most economical transportation is used.

Unprepared Scrap: Above prices are for prepared scrap. Maximum prices for unprepared scrap are $2.50 less than for the corresponding grades of prepared scrap, except for heavy breakable cast. In no case shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Graveyard autos not considered unprepared scrap.

Remote Scrap: Consists of all grades, except railroad scrap, located in Florida, Montana, Idaho, Wyoming, Nevada, Arizona, New Mexico, Texas, Oklahoma, Oregon, Washington and Utah. Delivered price may exceed by not more than $5 the price at the basing point nearest consumer's plant, provided sworn details furnished OPA. Permission required to exceed by more than $5 the nearest basing point price. Colorado scrap is remote scrap for Colorado consumers only.



"HIGHBALL"

In railroad language the clear track signal means "keep 'em rolling". Speed is tremendously important today but the railroads never lose sight of the need for safety.

In steel making the rules are the same—our path is clear and speed is terribly urgent. But again there is the same need for safety—for close control over every stage in steel making so that the product will meet specifications and do the job it was intended to do.

All the resources of the 147-year old Standard Steel organization are today devoted to beating every production schedule.

STEEL FORGINGS & CASTINGS • WELDLESS RINGS • STEEL WHEELS

Standard flies the Navy Bureau of Ordnance Flag and "E" Pennant in recognition of excellency and achievement in the production of Naval ordnance materiel.

STANDARD STEEL WORKS

DIVISION OF
THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA

Sheets, Strip

Sheet & Strip Prices, Page 96

Some sheet mills find delivery schedules slightly easier since considerable miscellaneous tonnage in lower priority brackets has been worked off. A large producer can deliver A-1-c tonnage or better within four to five weeks, in both hot and cold-rolled grades. On tonnage down to A-1-j it can promise about seven weeks. Many other mills can not do as well, by two or three weeks.

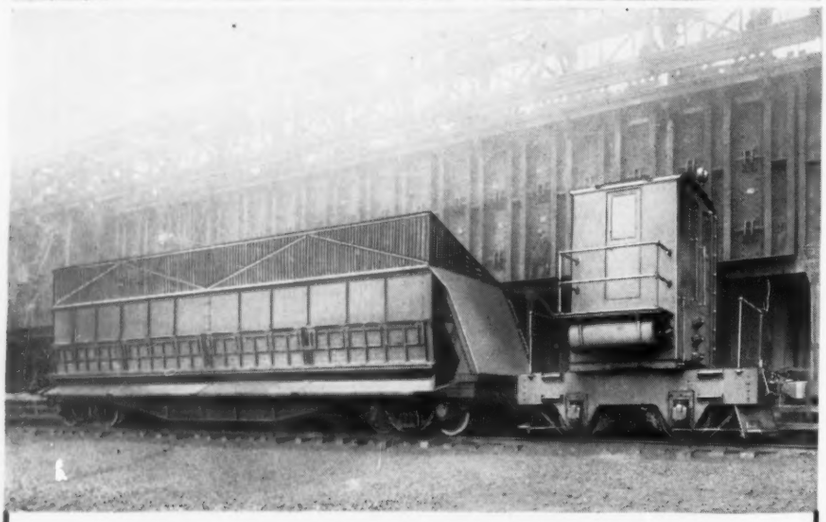
Commercial and low-priority demand has declined sharply in recent weeks, as mills could not make definite promises, but enough high preference business is being received to balance this. While number of orders is less they are individually larger than normal. Fabricators who have completed conversion to war production are increasing their requirements. Drum makers, whose product is highly essential to the war effort, require heavy supplies of sheets.

Ammunition and tool boxes take substantial tonnages, some of the latter in heavy gages. Large orders for long ternes are being placed for incendiary bomb case linings.

Shipbuilding is taking a large aggregate tonnage of sheets for galley equipment and for cowl ventilators, the latter taking 14 to 16 gage.

Metal household furniture manufacture is to stop June 1 under order of WPB. Until May 31 use of steel in furniture is to be cut 30 to 65 per cent, depending on the size of the producer. The entire industry eventually is to be converted to direct war production. The regulation affects all furniture containing more than 5 per cent of metal by weight, exclusive of nails and joining hardware.

COKE OVEN EQUIPMENT



QUENCHING CARS AND LOCOMOTIVES

All Atlas Coke Oven Equipment is of heavy-duty construction permitting the peak operating conditions required in today's stepped-up production schedules. As a result of years of experience, Atlas is able to design and build equipment, to meet the requirements of each particular coke plant. Detailed information available on request.

Other ATLAS Products

Ore Transfer Cars
•
Scale Charging Cars
•
Electrically Operated Cars for Every Haulage Purpose

Locomotives for Switching and Interplant Haulage
•
Turntables

The ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1100 IVANHOE RD. CLEVELAND, OHIO, U. S. A.

Plates

Plate Prices, Page 97

While April plate allocations have not been received by producers indications are that more tonnage will be rejected than accepted, mills being advised by Washington as to consumers who will not be allowed any tonnage.

Many consumers asked for more plates for April delivery than they have asked or received this year. Under new regulations requiring filing of requests by the first of the month preceding delivery month many asked for larger supply than previously. Most of this is rated A-10 or better, mills not being allowed to book anything below that level.

Much of this will be rejected and probably little will be allocated under A-3, with most in the A-1 classifications. Every effort is being made to divert all tonnage possible to strip mills, to relieve the burden on sheared plate mills, now engaged almost 100 per cent on ship work, principally for the Navy. To this end steel plate consumers have been asked by Iron and Steel Branch of the War Production Board to conform to a list of requirements in placing orders, so that as much as possible may be placed with continuous strip mills.

Heavier gages of floor plates are being allocated and lighter gages are in strong demand, backlogs having mounted and deliveries lengthened. Most sheared and universal plate volume is being allocated, the remainder being in the A-1 priority classification. A 700-ton steel pipe project in New England requiring ¼-inch plates is being held up for a higher rating while plans for a large steel pipe water line at Springfield, Mass., are being revised to eliminate plates. Allocated tonnage is also subject to revisions, tonnage for one consumer being shifted from one mill to another, notably in one instance where a mill is rolling armor plate steel. Heads and flanged work are now sold under high ratings, but still are available to consumers ahead of plates.

PLATE CONTRACTS PLACED

100 tons, elevated steel water tank, Chicopee, Mass., to Pittsburgh-Des Moines Steel Co., Pittsburgh, $58,920.

Bars

Bar Prices, Page 96

Deliveries of hot and cold-rolled bars show little change, hot mills offering about ten weeks on top

priorities. When hot material is not already in stock most cold drawers add two to three weeks to this schedule.

Cold-drawn bar sellers have been asked to file certified inventories of hot and cold-rolled material for manufacture of shells and shell and bomb components, but for which they have no formal orders on hand. Considerable tonnage of cold-drawn steel is going into armor-piercing shells and various components of gun mounts.

Award of approximately 3759 tons of nickel-molybdenum-vanadium steel bars for dielock chain, for delivery at Boston on an alloy bar inquiry, is supplemented by an additional 715 tons for the same requirements on which Republic Steel Corp., Massillon, O., is low at $74,425.10. This material is up to 3 7/16-inch diameter, slow cooled after rolling, for better shearing.

Pipe

Pipe Prices, Page 97

Lack of semifinished steel is the chief limiting factor in steel pipe production, both integrated and nonintegrated mills suffering from diversion to other purposes. Demand for standard pipe from secondary markets is weakening, the ban on residential construction and on all but hot-air heating cutting deeply.

War demand for mechanical tubing is heavy and increased activity in aircraft, tank and ship construction calls for additional tonnage. Oil country goods are moving as well as supply of semifinished will allow. Railroad demand is increasing, particularly for locomotive construction and repair. Miscellaneous buying of standard pipe has dropped considerably and warehouses now are the principal source of supply.

Cast iron pipe is in strong demand for new war plant construction but municipal buying is light.

CAST PIPE PLACED

1000 tons, 24-inch and under, New London, Conn., to United States Pipe & Foundry Co., Burlington, N. J.

500 tons, 6 to 16-inch, United States engineer, Washington, to Warren Pipe & Foundry Co., Phillipsburg, N. J.

450 tons, various sizes, Newport, R. I., to Warren Pipe Co., Everett, Mass.

476 tons, defense public works, San Luis Obispo, Calif., allocated as follows: 300 tons of 18-inch to United States Pipe & Foundry Co. and 176 tons of 12-inch to Pacific States Cast Iron Pipe Co., Provo, Utah.

312 tons, Empire Way and West Seattle housing projects, Seattle, universal pipe, to Marckman & Williams, Seattle, for Central Foundry Co.

214 tons, 12-inch, class 150, Seattle, to United States Pipe & Foundry Co., Burlington, N. J.

CAST PIPE PENDING

1400 tons, 2 to 16-inch, cast iron or cement asbestos pipe, water system, airport, Roswell, N. Mex.; bids opened.

600 tons, 6 and 8-inch, Fairlawn, N. J.; bids in.

210 tons, water system, airport, San Bernardino, Calif., for United States engineer office, Los Angeles; bids opened.

Unstated, extension and repairs Water

Faster Driving • Fewer Operations • Stronger Fastenings = 50% Less Assembly Cost with Phillips Screws!

Consider the more frequent use of power drivers with Phillips Screws. There's no danger of driver point slipping from a Phillips recess, so there's no need to go slow. Phillips cuts actual screw-*driving* time to a fraction.

Add the saving through eliminating the extra work required with slotted screws—drilling pilot holes, two-handed starting, withdrawing crooked screws, driving in awkward positions, etc. Phillips Screws set up tight—without split screw heads or burrs—at an average cost saving of 50%.

Busy defense plants are using Phillips for double-quick assembly *speed*. Non-defense plants use Phillips for 50% less assembly *cost*. Get the facts from one of the firms listed below.

PHILLIPS RECESSED HEAD SCREWS GIVE YOU 2 for 1 (SPEED AT LOWER COST)

WOOD SCREWS • MACHINE SCREWS • SHEET METAL SCREWS • STOVE BOLTS • SPECIAL THREAD-CUTTING SCREWS • SCREWS WITH LOCK WASHERS

U. S. Patents on Product and Methods Nos. 2,046,343; 2,046,837; 2,046,839; 2,046,840; 2,082,085; 2,084,078; 2,084,079; 2,090,338. Other Domestic and Foreign Patents Allowed and Pending.

American Screw Co., Providence, R. I.
The Bristol Co., Waterbury, Conn.
Central Screw Co., Chicago, Ill.
Chandler Products Corp., Cleveland, Ohio
Continental Screw Co., New Bedford, Mass.
The Corbin Screw Corp., New Britain, Conn.
International Screw Co., Detroit, Mich.
The Lamson & Sessions Co., Cleveland, Ohio
The National Screw & Mfg. Co., Cleveland, Ohio
New England Screw Co., Keene, N.H.
The Charles Parker Co., Meriden, Conn.
Parker-Kalon Corp., New York, N.Y.
Pawtucket Screw Co., Pawtucket, R.I.
Pheoll Manufacturing Co., Chicago, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N.Y.
Scovill Manufacturing Co., Waterbury, Conn.
Shakeproof Inc., Chicago, Ill.
The Southington Hardware Mfg. Co., Southington, Conn.
Whitney Screw Corp., Nashua, N.H.

District No. 61, Seattle; $118,300 available; bids soon.

Unstated, 230,000 feet 2 to 10-inch, Pinehurst district, near Everett, Wash.; bids to J. B. Gorton, secretary, March 31; Parker & Hill, Seattle, engineers.

Rails, Cars

Track Material Prices, Page 97

Despite difficulties experienced by car and locomotive builders in obtaining sufficient steel for capacity production railroads continue to place orders for both kinds of rolling stock. The War Department has placed 26 narrow-gage passenger cars for Newfoundland service with the Canadian Car & Foundry Co. and is inquiring for 20 to 60 narrow-gage steam locomotives of 2-8-2 type. These are of a similar type to those purchased late last year, and will carry a high priority rating.

Chicago, Milwaukee, St. Paul & Pacific will build in its own shops 35 covered hoppers and 35 mill-type gondolas, all of 70-ton capacity. Baldwin Locomotive Works is inquiring for five 50-ton flat cars and five self-clearing hoppers, in addition to 15 gondolas for which an earlier inquiry was issued.

CAR ORDERS PLACED

Chicago, Milwaukee, St. Paul & Pacific, 35 seventy-ton covered hopper cars and 35 seventy-ton mill type gondola cars; to own shops.

War Department, 26 narrow-gage passenger train cars, for service in Newfoundland, to Canadian Car & Foundry Co., Montreal; include eight first class coaches, five sleeping cars, four express cars, three diners, three baggage cars and three mail cars.

CAR ORDERS PENDING

Baldwin Locomotive Works, six 50-ton flat cars and five self-clearing hopper cars; bids asked; in addition to 15 fifty-ton drop-end gondolas noted in a previous issue.

LOCOMOTIVES PENDING

Indianapolis Union, one or two 0-8-0 type switch engines; bids asked.

War Department, 20, 40 or 60 forty-two-inch-gage steam locomotives, bids asked; materials required with carry A-1-1 priority.

BUSES BOOKED

A.c.f. Motors Co., New York: Twenty-three 43-passenger for Bureau of Supplies and Accounts, Navy Department, Washington; ten 34-passenger for Southern Pennsylvania Bus Co., Chester, Pa.; three 32-passenger for Middlesex & Boston Street Railway Co., Newtonville, Mass.; two 36-passenger for Memphis Street Railway Co., Memphis, Tenn.; two 31-passenger for Fort Worth Transit Co., Fort Worth, Tex.; two 36-passenger for Conestoga Transportation Co., Lancaster, Pa.; three 33-passenger for Southeastern Greyhound Lines, Lexington, Ky.

Twin Coach Co., Kent, O.: Twenty-eight 44-passenger for Surface Transportation Co., New York; twenty 31-passenger for Syracuse Transit Corp., Syracuse, N. Y.; ten 32-passenger for Cleveland Railway Co., Cleveland; eight 31-passenger for Galveston Electric Co., Galveston, Tex.; six 30-passenger for Erie Coach Co., Erie, Pa.; five 41-passenger for Boston Elevated Railway Co., Boston; two 37-passenger and one 29-passenger for New Haven & Shore Line Railway Co., New London, Conn.; two 31-passenger and one 29-passenger for White Transit Co., Wilkes-Barre, Pa.; one 31-passenger and one 32-passenger for Valley Motor Transit Co., East Liverpool, O.; two 33-passenger for Suburban Transit System, Worth, Ill.

A carburizer to be versatilely efficient must possess properties other than its performance with molten steel. No. 348 Mexican Graphite is especially sized and processed and conveniently packaged to conserve a minimum of space in the furnace and on the floor. The densest, most soluble carbon obtainable for use in acid open hearth charges . . . free of sulphur and harmful impurities . . . provides over 70% carbon recovery with consistent, dependable results. Quiet action with 100% scrap charges. We invite correspondence regarding your problems.

THE UNITED STATES GRAPHITE CO.
SAGINAW MICH.

NO. 348 MEXICAN GRAPHITE

Structural Shapes

Structural Shape Prices, Page 97

Structural requirements for war purposes are expanding, additions at an eastern steel mill calling for 13,000 tons and 775 tons is pending for additions to an eastern navy yard. Private work is practically absent from the market.

Bookings and shipments of fabricated steel during January and February, mainly for war purposes, were smaller than in the corresponding months in 1941, according to the American Institute of Steel Construction. February bookings, 220,205 net tons, were the largest since June, 1941, and larger than the monthly average for 1941. New business booked in two months this year totaled 400,507 tons, compared with 454,794 tons in the first two

SHAPE AWARDS COMPARED

	Tons
Week ended March 28	27,510
Week ended March 21	19,968
Week ended March 14	8,075
This week, 1941	35,067
Weekly average, 1942	21,937
Weekly average, 1941	27,373
Weekly average, Feb., 1942	26,015
Total, 1941	392,291
Total, 1942	263,248

Includes awards of 100 tons or more.

months last year. Shipments in two months this year totaled 312,612 tons, compared with 325,944 tons in two months a year ago. February shipments were 153,732 tons, against 158,880 tons in January.

SHAPE CONTRACTS PLACED

17,400 tons, bomber plant, divided among group of western fabricators, including Tulsa Boiler & Machinery Co., Tulsa, Okla.; Patterson Steel Co., Tulsa, Okla.; Muskogee Iron Works, Muskogee, Okla.; and J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

4500 tons, hangar at army airport in western area to Bethlehem Steel Co., Seattle; Henry Georg, Spokane, contractor.

1700 tons, building for Kaiser Shipbuilding Co., Richmond, Calif., to Bethlehem Steel Co., San Francisco.

1200 tons, addition, Farrel-Birmingham Co., Buffalo, to R. S. McMannus Steel Construction Co. Inc., Buffalo.

1000 tons, assembly shop, Richmond Shipbuilding Co., Richmond, Calif., to Herrick Iron Works, Oakland, Calif.

625 tons, recreation building, Norfolk, Va., to Lehigh Structural Steel Co., Allentown, Pa.

420 tons, Arlington Heights dwellings, Pittsburgh, to Guibert Steel Co., Pittsburgh; James McHugh, Chicago, contractor.

275 tons, antenna towers, Civilian Aeronautical Authority, Washington, various deliveries, to Lehigh Structural Steel Co., Allentown, Pa.

250 tons, plant addition, Kimble Glass Co., Vineland, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, arsenal gage shop, to Lehigh Structural Steel Co., Allentown, Pa.

SHAPE CONTRACTS PENDING

2600 tons, widening, Whitestone bridge, New York; Harris Structural Steel Co., New York, only bidder, March 20; over appropriation.

2500 tons, second Nisqually power development; bids to Tacoma Board of Contracts and Awards, March 30.

1800 tons, steel towers for Nisqually project, Tacoma; Bethlehem Steel Co., Seattle, low, $208,417.

900 tons, additional building, Portsmouth, N. H.; Sanders Engineering Corp., Portland, Me., contractor.

500 tons, shipyard structures, Dravo Corp., Pittsburgh, at eastern point.

300 tons, three buildings, Floyd Bennett Field, New York; Lehigh Structural Steel Co., Allentown, Pa., low.

Unstated, material for tide flats substation, municipal light plant; bids to Tacoma, March 30.

Reinforcing Bars

Reinforcing Bar Prices, Page 97

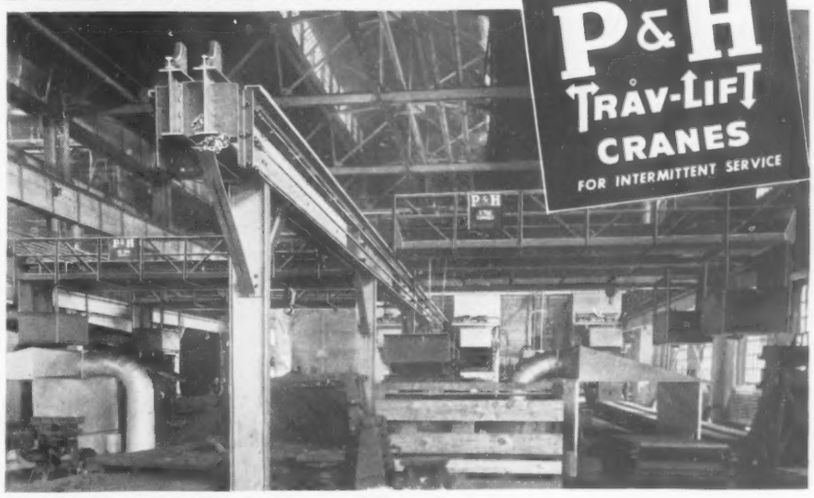
Many distributors of reinforcing steel are sold for the remainder of the year on high ratings, largely for war construction. Little steel for rolling is available to mills be-

CONCRETE BARS COMPARED

	Tons
Week ended March 28	7,180
Week ended March 21	7,262
Week ended March 14	13,307
This week, 1941	12,628
Weekly average, 1942	3,069
Weekly average, 1941	13,509
Weekly average, Feb., 1942	3,489
Total, 1941	133,506
Total, 1942	96,835

Includes awards of 100 tons or more.

DELIVERIES ON TIME!



TO SPEED DEFENSE, P&H has cut delivery time on these three types of materials handling equipment from 38% to 46% in 7 months of intensive production effort. You now get faster delivery and you don't need "expediters" to get this vital equipment from P&H.

FASTER MOVEMENT of materials enables you to produce more in less time, to save manpower, to cut costs. You'll be needing this greater efficiency. Plan your production *now* and depend upon P&H's honest delivery promises.

Whether it's "thru the air" for long distances, or "spot handling" around machine tools, you can count on P&H Hoists to deliver quickly, smoothly, safely. *Not a late delivery in 6 months* . . . that's P&H's record, and *Honesty is still our policy.* Just ask P&H engineers to show you how you can gain this advantage, or write us direct.

General Offices: 4411 West National Avenue, Milwaukee, Wisconsin

HARNISCHFEGER
CORPORATION
HOISTS • WELDING ELECTRODES • MOTORS P&H EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

low the A-1 group. Several thousand tons for housing projects is pending, on high preference.

Belief is growing that a ceiling will be placed on fabricated reinforcing bar prices within a short time.

REINFORCING STEEL AWARDS

3000 tons, reinforced concrete tanks, East Boston, Mass., to Truscon Steel Co., Youngstown, O.

1275 tons, overpass, Fourteenth street and Maine avenue, Washington, to Bethlehem Steel Co., Bethlehem, Pa., through National Excavators & Structures Corp., New York.

1255 tons, Bureau of Reclamation, invitation B-33,075-A, Coram, Calif., to Carnegie-Illinois Steel Corp., Pittsburgh.

850 tons, building, veterans' hospital, Roxbury district, Boston, to Northern Steel Co., Medford, Mass.

250 tons, water softening plant, Ford Motor Co., Ypsilanti, Mich., to Great Lakes Steel Corp., Detroit, through Concrete Steel Fireproofing Co., Detroit.

100 to 400 tons, expansion, propeller division, Curtiss-Wright Corp., to Bethlehem Steel Co., Bethlehem, Pa.; John W. Ryan Construction Co., New York, contractor.

100 tons, expansion, Clark Equipment Co., Battle Creek, Mich., to Ceco Steel Products Co., Chicago.

100 tons, ordnance plant, to Joseph T. Ryerson & Son Inc., Chicago; James Stewart Corp., Chicago, contractor.

100 tons or more, housing project, Norfolk, Va., to Truscon Steel Co., Youngstown, O., through James I. Barnes Construction Co., Greensboro, N. C.

REINFORCING STEEL PENDING

2300 tons, Inv. 257-42-134, Dennison, Tex., for United States engineer, War Department; bids March 31.

1250 tons, Bureau of Reclamation invitation B-33,131-A, Coram Calif.; bids Apr. 3.

925 tons, Bureau of Reclamation, invitation B-33,105-A, Coram, Calif.; bids opened.

300 tons, Inv. C46442A, Kremling, Colo., for Bureau of Reclamation; bids to Denver, March 24.

206 tons, Inv. B33125A, Coram, Calif., for Bureau of Reclamation; bids to Denver, March 23.

202 tons, Inv. B33126A, Coram, Calif., for Bureau of Reclamation; bids to Denver, March 25.

177 tons, Inv. B33124A, Coram Calif., for Bureau of Reclamation; bids to Denver, March 24.

FOR THE MAXIMUM

in **TIN PLATE PRODUCTION**

. . . look to the modern tin stacks. They are equipped with Kemp Immersion Melting.

For Speed — Minimum Dross Formation—and Top Quality in tin plate manufacture, write **The C. M. Kemp Manufacturing Co., 405 East Oliver St., Baltimore, Maryland.**

KEMP of BALTIMORE

Scrap

Scrap Prices, Page 100

Definite improvement in scrap supply has appeared in the past fortnight and various steelmaking centers have received sufficient material to permit increased production. Effect of numerous drives to uncover dormant supplies has been felt and tonnages are much larger than for some weeks past. Automobile wrecking yards are moving tonnage more rapidly and farm collections are better. Efforts to obtain obsolete material from industrial sources are also yielding results.

Apparently the squeeze is past and supply for the next few months seems likely to be better until winter again restricts collections. Some allocations have been necessary to prevent steelmakers from curtailing further, but they are becoming fewer.

To expedite reclaiming of large tonnages of scrap iron and steel now blocked by legal, financial and other obstacles, a new special projects salvage section has been set up by War Production Board Conservation Bureau. Field offices will

Tool Steel Scrap

Cents per pound, to consumers f.o.b. shipping point

Tungsten Types

(For each 1% tungsten contained)

Solid scrap containing over 12%	1.80c
Solid scrap containing 5 to 12%	1.60
Turnings, millings containing over 12%	1.60
Do., 5 to 12%	1.40
Turnings, millings, solids under 5%	1.25

Molybdenum Types

Solid scrap, not less than 7% molybdenum, 0.50 vanadium	12.50
Turnings, millings, same basis	10.50
Solid scrap, not less than 3% molybdenum, 4% tungsten, 1% vanadium	13.50
Turnings, millings, same basis	11.50

Mixed Scrap

(Molybdenum and Tungsten Types)

Solid scrap, each 1% contained tungsten	1.60
Solid scrap, each 1% molybdenum	.80
Millings, turnings, each 1% tungsten	1.40
Millings, turnings, each 1% molybdenum	.70

be set up in 20 or more principal centers. Abandoned street railway tracks estimated to contain more than 300,000 tons of scrap are among projects to be attacked. Where owners refuse to co-operate the board has power to requisition.

Better scrap supplies are being received in many consuming centers as spring advances and country accumulations are made available. Automobile wrecking is yielding increasing tonnage as the field is combed more closely. More remote scrap is being shipped to western and midwestern consumers and railroad distribution is placing scrap where most needed, under the allocation system.

A widespread salvage campaign at Buffalo has resulted in a substantial increase in supply, to the extent that Bethlehem Steel Co. has relighted four open hearths idle since October. Numerous potential sources of large tonnages have been uncovered, including old buildings to be wrecked and abandoned street railway tracks. Opening of navigation is expected to bring large tonnages from the head of the lakes.

Allocation of scrap to Ford Motor Co. plants at Detroit, including one lot of 3000 tons from Chrysler plants, has relieved shortage and three idle open hearths resumed, bringing production near capacity.

OPA officials indicate the present plan of billing the freight increase to consumers in addition to price ceilings will be allowed to stand for the present, rather than revamp the price schedule. It is stated by these officials that the additional freight charge will amount to about 5 cents per ton of steel.

Pig Iron

Pig Iron Prices, Page 98

April pig iron allocations show increase in proportion of allocations in the A group and less tonnage for B priorities. Delivered prices reflect the recent increase in freight rates but price is a minor consideration at this time.

Foundries are in somewhat easier position as scrap supplies are measureably better, though cast scrap is still scarce. Stove plants with army work are busier than those supplying civilian trade and stocks of dealers are much below normal.

New England textile mill equipment makers are taking on more war contracts, affecting machine shop departments relatively more than foundries, though the latter are more active.

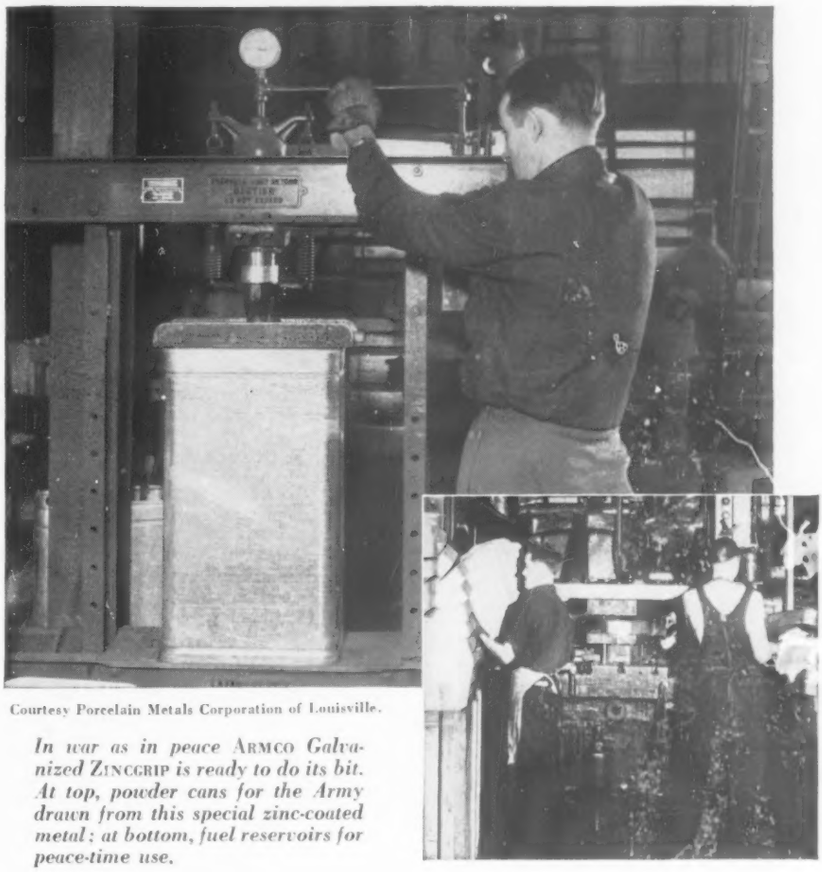
Warehouse

Warehouse Prices, Page 99

Mill shipments to warehouse has not improved materially and stocks still are far below sufficient to meet demand, with assortments badly broken. Expectation that supply of structural shapes would be larger this spring have not been fulfilled.

Priority problems of distributors and wholesalers will be simplified by use of a new application form, PD-1X, to be available after April

TO KEY MEN: Can You Use Sheet Metal Working Data for War Products—and Post-War Plans?



Courtesy Porcelain Metals Corporation of Louisville.

In war as in peace ARMCO *Galvanized* ZINCGRIP *is ready to do its bit. At top, powder cans for the Army drawn from this special zinc-coated metal; at bottom, fuel reservoirs for peace-time use.*

SAVED: 50% ZINC

When a manufacturer used ARMCO Steel ZINCGRIP in redesigning a powder box for the Army, this is the way he said "thumbs up!" . . .

- Saved at least 50 per cent of the zinc consumed by the old method.
- Reduced the weight of each box 10 per cent (four pounds).
- Stepped up production. • Guarded against powder contamination.
- Assured corrosion resistance and long service life for these boxes.

The reasons? ARMCO ZINCGRIP is a mill-coated galvanized metal—ready for drawing and forming operations. The tightly adherent ZINCGRIP coating won't flake or peel in a press. This means unbroken zinc protection *along the edges.*

Are you making war equipment that might cost less and work better if you used ARMCO Galvanized ZINCGRIP sheets or coils? Let's talk it over. Just address your letter to The American Rolling Mill Company, 991 Curtis Street, Middletown, Ohio.

A LABEL KNOWN TO MILLIONS

MADE OF ARMCO INGOT IRON ZINCGRIP

1. As far as possible, without interfering with war requirements priority, assistance will be given to those who apply on the new form to permit sufficient stocks to maintain essential production and service industries in operation. The new form is not designed to cover all distributors' requirements for priority assistance. Sales under a priority rating allow extension of the priority to the producer. The new provision is to enable inventories of products sold in small quantities to be maintained at a working minimum. Order L-63, limiting inventory size, will precede use of PD-1X and quantities under the latter will be limited by the former.

Pacific Coast

San Francisco—The most active market is that for ship construction. Demand, generally, continues strong.

A considerable tonnage of cast iron pipe for army and naval work is being placed. Demand from municipalities lags somewhat and few inquiries of importance have come into the market so far this year.

Practically all reinforcing bars rolled on the Pacific Coast are going into national defense projects and little finds its way into the hands of private interests. The largest letting went to Carnegie-Illinois Steel Corp. and involved 1255 tons for the Bureau of Reclamation for delivery at Coram, Calif. Bids have also been taken by the same interest for delivery at the same place on 925 tons and bids will be opened April 3 for 1250 tons for delivery at Coram, Calif. Awards totaled 2260 tons and brought the aggregate for the year to 14,483 tons, compared with 19,045 tons for the same period last year.

Seattle—Expansion of shipbuilding facilities, awards for large cantonment and hangar projects and opening of bids for heavy equipment for Bonneville Power Administration held attention this week in the Pacific Northwest.

The government has acquired eleven acres at Seattle, where it is planned to expend $6,000,000 in construction of two dry docks and other facilities essential to the Navy program. Work has begun on the Swan Island shipyard and the Kaiser ship construction plant in Washington is being rushed.

United States engineers, Portland, has placed a number of large contracts with leading construction firms for cantonment projects in the western area. Figures have not been released but the contracts are of major size. Awards have been made to the following firms: Kloepfer & Cahoon, Boise, Idaho, and J. W. Brennan, Pocatello, Idaho; Frank Lohse, Portland, Oreg.; Ertz, Burns & Co., Lorenz Bros., Donald M. Drake and Parker-Schram Co., Portland, combined bid. A-1 and A-2 to MacDonald Building Co. and Strong & MacDonald, Tacoma; B-1 to Ben H. Sheldon, Spokane, Wash., MacDonald Building Co., Strong & MacDonald, H. S. Wright, Seattle, W. C. Smith and L. H. Hoffman, Portland; B-2 to Lovering Construction Co., St. Paul, Halverson Construction Co., Billings and John Sletten, Great Falls, Mont.; D. Moore & Roberts, San Francisco, Elmer J. Freethy, Richmond, Cal., Smith, Wright and Hoffman.

Westinghouse has been awarded a $822,610 contract for furnishing ten transformers for the Grand Coulee powerhouse. Bonneville Power Adm. reports General Electric Co. low, $958,395 for 115 and 230-kv circuit breakers at Longview, Spokane, Portland, Ampere and Covington; General Cable Corp. New York, awarded a $783,513 contract for conductor and accessories for the Coulee-Spokane transmission lines. Other low bids: Corning Glass Works, Corning, N. Y., $113,100 for suspension insulators; Allis-Chalmers Mfg. Co., Milwaukee, $10,950 for 15-kv circuit breakers for Ampere.

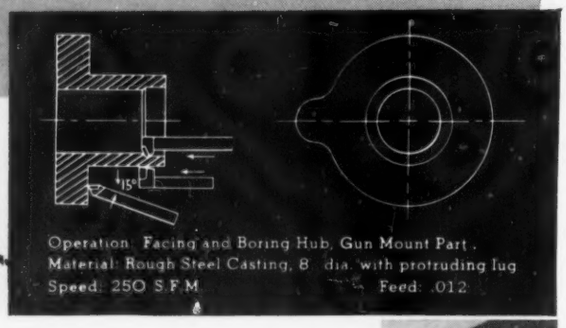
One of the largest concrete buildings in the West, 743 by 84 feet and 200 feet high, is being constructed at Grand Coulee dam for the east powerhouse, to be completed well under the schedule of 560 days. The structure will house nine 108,000-kw. generators. The west powerhouse has two 108,000-kw. generators in operation, another will start in April and the remaining six are being installed.

Difficulty in obtaining plates may

When More Speed Means More Guns

KENNAMETAL TOOLS

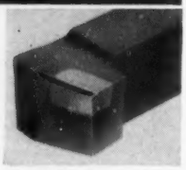
DO 8 HOURS' WORK IN 90 MINUTES


15°
Operation: Facing and Boring Hub, Gun Mount Part.
Material: Rough Steel Casting, 8" dia. with protruding lug
Speed: 250 S.F.M.
Feed: .012

The tool set-up above shows how KENNAMETAL tools are giving one manufacturer an 80% time saving in machining parts for gun mounts. Previously, the facing operation was accomplished by use of a special alloy high speed tool bit protruding 3", doing the interrupted facing cut.

In the KENNAMETAL set-up the compound rest was swung 90° for rigidity and a standard 20T150 KENNAMETAL planer tool, held as shown to cut to a square shoulder, was used for facing. Previously, the tools had always headed into the cut and the carriage had to be backed off, but KENNAMETAL TOOLS did the work so smoothly that only one cut was required, instead of two. Roughness of casting and interrupted cut made the negative rake angles of the style 20 tool preferable to the standard facing tool style 12. A KENNAMETAL 21T150 tool with a 2½" overhang was used for boring, and a KENNAMETAL 9T80 tool turned the outside diameter. This set-up, and the KENNAMETAL tools employed, permitted completion of each job in 90 minutes, *a saving of 6½ hours per job.*

KENNAMETAL is proving itself by similar performance in armament plants throughout the country . . . machining steel of all hardnesses up to 550 Brinell at economical high speeds, with minimum tool wear and longer life between regrinds. Write for free copy of the new vest pocket manual for KENNAMETAL users.



STYLE NO. 21

STYLE NO. 20

STYLE NO. 9

McKENNA METALS Co.
200 LLOYD AVE., LATROBE, PENNA.
Foreign Sales: U. S. STEEL EXPORT CO., 30 Church St., New York
(Exclusive of Canada and Great Britain)

KENNAMETAL
The Accepted
STEEL CUTTING
CARBIDE

cause Seattle to rescind a contract for 600 tons of steel pipe for the Airport Way improvement. If awarded cast iron the job will total 1100 tons, 24 to 30-inch. Two water districts near Seattle are calling for unstated tonnages of supply and distribution water mains.

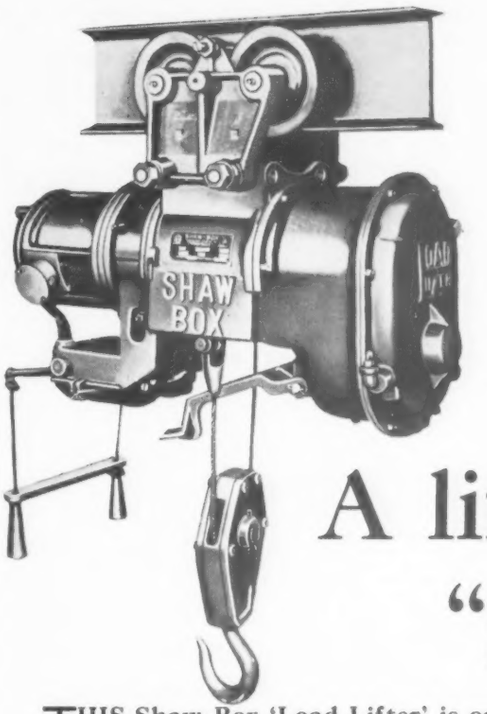
Mills report increased receipts of scrap but dealers still complain of bottlenecks under existing regulations which do not allow them sufficient margin to pay costs of preparation. The situation has helped to aggravate the apparent shortage of cast iron scrap which dealers claim is due to lack of segregation. Foundries are exploring every source for materials. Everett, Wash. has received bids for the sale of an unstated tonnage of used street car rails.

Canada

Toronto, Ont.—Owing to sharp curtailment of many civilian articles inquiries from non-war industry consumers are less. However, there has been no decline in demand from war consumers and practically all business now is directly connected with government contracts. A check of warehouses reveals that they are short of steel and are entirely out of some lines, with little prospect of replenishing. Dealers in used steel are meeting heavy demand and many small manufacturers are turning to this source as they are unable to obtain deliveries from mills or warehouses. It was reported recently that some dealers in used steel were quoting prices similar to or above those for new material, which consumers have been prepared to pay as long as they could get delivery. However, action has been taken by the Wartime Prices and Trades Board and exhorbitant prices have disappeared. Mining concerns are having difficulty buying drill steel and one company reported paying $1 per pound for one-inch octagon. Steel Co. of Canada Ltd., has given no reason for adhering to its old prices on steel in face of the $5 increase by other Canadian producers.

Improvement in plate delivery for shipbuilding is expected with the starting up of the plate mill at Sydney, N. S. In recent months there has been some slowing down in shipbuilding operations, due to shortage of steel, but this condition has been improving during the past couple of weeks and while shipbuilders are again speeding up they are still well below capacity. War tank makers and freight car builders also have been affected by shortage of plates and the latter still are waiting for steel to complete 1941 orders. The government, through the Steel Controllers' department, is keeping a watchful eye on plate output and is directing suplies into channels where production is most urgently needed. Practically no business is being closed for sheets or strip, other than that coming directly through government channels.

Demand for merchant bars is more persistent and while mills are ac-



A lifting "genius"

THIS Shaw-Box 'Load Lifter' is one of the most practical, economical and adaptable electric hoists ever built. Low-cost operation is engineered into the rugged simple construction. No other hoist has all the specific lifting advantages of the 'Load Lifter'. Among them are these:

1. "One-point" lubrication.
2. Hyatt Roller Bearings and Ball Bearing Motor.
3. Safety upper stop; lower blocks; sure brakes.
4. Two-gear reduction drive; sealed against oil leaks; steel interchangeable suspension.

'Load Lifter' electric hoists are built with lifting capacities of 500 lbs. to 40,000 lbs. in all combinations required for industrial lifting necessities. They are adaptable to almost every working condition within their capacities. Send for Bulletin 350.

MANNING MAXWELL & MOORE INC. M&M TRADE MARK

'LOAD LIFTER' *Hoists*

MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN

Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load-Lifter' Hoists and other lifting specialties. Makers of Ashcroft Gauges, Hancock Valves, Consolidated Safety and Relief Valves and 'American' commercial instruments.

cepting orders they give no definite delivery promise. Bar orders extend to the end of the year and additional requirements are appearing.

Structural steel lettings have dropped sharply, with total recent awards just over 3000 tons. However, large orders are pending and awards totaling around 20,000 tons are expected within the next two or three weeks in connection with war plant projects. Despite the fact that in government projects wood is being used wherever possible, many undertakings require steel. Canadian structural mills report backlogs that will keep plants at capacity for months and fabricators are equally busy.

While some slowing down in deliveries of foundry and malleable pig iron was reported during the past few days, this was due to limited supply rather than smaller demand. Sales for the past week fell to about 7000 tons. Most melters now are engaged on war work and as a result are receiving priority treatment.

Scrap offerings are gaining as weather conditions improve. The government has announced action which will bring a much larger quantity of automobile scrap on the market during the next few months. Most of the scrap reaching dealers is steel grades and this is being quickly absorbed. While there has been some betterment in supply of iron scrap dealers continue to report shortage. Stove plate is scarce.

Tin Plate

Tin Plate Prices, Page 97

Increase in facilities for production of electrolytic tin plate, to save large tonnage of tin, is being pushed. United States Steel Corp. is adding two electrolytic and two chemical treatment lines at each of three plants, in addition to similar work already under way. Saving of tin is estimated at 6,750,000 pounds annually.

Iron Ore

Iron Ore Prices, Page 99

First cargoes of steelmaking material to move on the Great Lakes this season were limestone from Calcite, Mich., to Gary, Ind., and South Chicago, Ill., carried by the CARL D. BRADLEY and B. H. TAYLOR, self-unloaders, taking material to plants of Carnegie-Illinois Steel Corp. They reached their destinations about ten days earlier than the record for any previous year. JOSEPH BLOCK, of Inland Steel Co.'s fleet, took a cargo of limestone from Port Inland, Mich., to its plant at Indiana Harbor, Ind., also setting a record for early arrival.

Ore carriers which left Lake Erie and Lake Michigan ports more than a week ago were helped through the Straits of Mackinac and St. Marys river by icebreakers, which also crushed a channel through thick ice in Whitefish Bay, Lake Superior.

Representatives of iron ore producers were in Washington last week, conferring with OPA relative to ore prices for 1942. Until an agreement is reached early billings are to be at last year's prices, based on $4.45 per ton for Mesabi nonbessemer. It is believed prices will be reaffirmed for this season.

Manganese Ore Receipts Are Growing Smaller

While it is too early to estimate manganese ore receipts for March, the trend during the first two months has been downward, with approximately 140,000 tons in January and 90,000 tons in February. Part of this is due to February being a shorter month. In January most tonnage came from India, with Brazil second, while in February Brazil was first and India second. In February by far the greater part of imported ore came from these two countries.

Within the past few days ocean shipping rates from Brazil have increased about 35 per cent, from $11 to $14.85. War risk insurance also has moved upward, now being about 5 per cent. Adding further to the cost railroad rates in Brazil have been advanced, reflecting higher operating costs, due to shortage of coal. This situation may curtail receipts of ore from Brazil, due to the apparent certainty of substantially higher asking prices.

Cuts Two 6" dia. Gear Blanks every 11 minutes.

There are 12 MARVEL Saws at the Northern Pump Co., Minneapolis, some of which are in their tenth year of service. The Giant Hydraulic No. 18 MARVEL pictured above, is a comparative newcomer in the Northern MARVEL family, having been installed just a few months ago, to speed up production on large work. When pictured, it was cutting-off blanks from 6" dia. S.A.E. 3120 hot rolled steel, two at a time, cutting-off two blanks every 11 minutes.

Whether you want thin slices or long lengths cut-off from flat or round bars, MARVEL Saws will produce more pieces per hour and will cut them off at lower cost per piece than any other machine or cutting-off method. Included in the MARVEL System are small inexpensive dry-cutting shop saws; heavy duty all-ball-bearing high speed hack saws (the fastest saws built); automatic production sawing machines that require no more operator attention than an automatic screw machine; a metal-cutting band saw that saves hours of machining, roughing to size and shape; and a Giant Hydraulic Hack Saw, that cuts the toughest steel with ease. MARVEL High-Speed Edge Hack Saw Blades are positively unbreakable, can be safely operated at maximum speed and feed on any hack sawing machine.

ARMSTRONG-BLUM MFG. CO. *"The Hack Saw People"*
5700 Bloomingdale Ave., Chicago, U.S.A. Eastern Sales: 225 Lafayette St., N.Y.

At present the Brazilian situation is confused, although new prices probably will be announced shortly.

Manganese ore sellers say the ocean freight situation has not yet affected c.i.f. prices on ore from India and South Africa and that until there is an increase on these ores shipments from Brazil are likely to be curtailed.

All private transactions in Chilean manganese ore have been called off, Metals Reserve Co. having not only contracted for a year ahead on all Chilean production, but also having recently purchased all stocks above ground in American commercial hands. An emergency measure, this resulted in cancellattion of several orders in this country. None of this ore probably will be moved from Chile for a number of months, shipping space being devoted to movement of copper, zinc and certain other materials more urgently needed.

Meanwhile, stocks on hand in this country are sufficient to meet requirements for several months, with domestic production now being increased more rapidly. Washington has let at least three new development contracts recently, including work on deposits at Batesville, Ark.

No more low phosphorus grade iron ore, 0.02 maximum, is now coming from Brazil, although some 68-69 per cent ordinary grade is being figured occasionally at about 8 cents per unit, f.o.b., Rio de Janeiro, an increase of ½-cent in recent weeks.

Chrome ore is unchanged in Indian and African grades, although Brazilian chrome is nominal, pending possible revision, due to changes in South African freight rates.

Ferroalloys

Ferroalloy Prices, Page 98

While ferromanganese consumers are being adequately supplied, producers are shipping to the limit of their output to do so. Meanwhile the trade is awaiting action by OPA on second quarter prices. Current prices have been extended only to April 15, pending consideration of request for higher prices. Delivered price at Pittsburgh has been advanced from $125.33 to $125.63 as a result of the recent increase in freight rates.

Action on spiegeleisen for second quarter was delaved because of the uncertainty of the ferromanganese price, the two alloys being closely related. However, the price on 19 to 21 per cent spiegeleisen was extended March 25 for second quarter, at $36, Palmerton, Pa. This price has been in effect since June 12, 1940, following an advance of $4 per ton at that time.

Steel in Europe

Foreign Steel Prices, Page 99

London—(*By Cable*)—The pig iron situation in Great Britain is generally satisfactory but low phosphorus iron is now restricted like hematite. Little change has taken

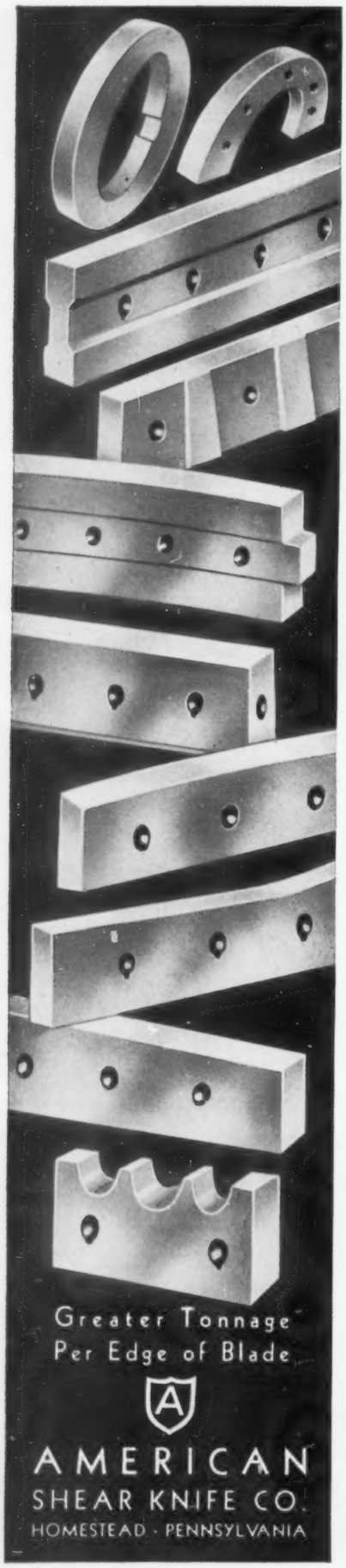
Production

AMERICA'S FIRST LINE OF DEFENSE

Back of our military and naval might and other visible defenses of our nation, is a productive America so great that even Americans fail to grasp its magnitude. It is an America of loyal, patriotic men and women, and machines — almost without number — that multiply the genius of man a thousandfold, and produce a never-ending stream of essential materials to safeguard America and our way of life. Keep production, America's first line of Defense, always moving forward.

THE ANDREWS STEEL CO.
NEWPORT, KENTUCKY
DIVISIONS
THE NEWPORT ROLLING MILL COMPANY
THE GLOBE IRON ROOFING & CORRUGATING CO.

Basic Open-Hearth Alloy Steel Billets and Slabs



place in the steel situation, with demand for structural shapes and sheets restricted. Tin plate is firm within the present limitations. Oil-plates are being gradually converted to terne plate.

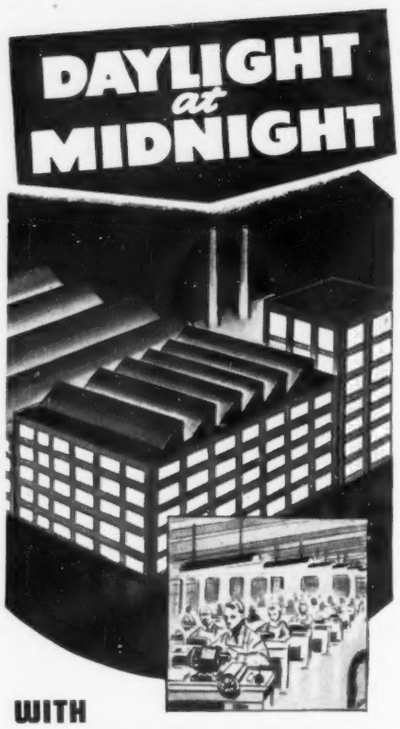
May Sell Bars, Strip Above Ceiling Price

OPA has granted Joslyn Mfg. & Supply Co., Chicago, permission to sell hot-rolled bars and strip at $4 per ton above Chicago base prices established as maximums under price schedule No. 6. Ceiling prices allowed the Joslyn company are 2.35c, Chicago, for hot-rolled bars and 2.30c, Chicago, for hot-rolled strip. The order is effective from March 25 and may be applied to shipments made on and after Jan. 1, 1942.

Equipment

Boston—Machine tool orders are again stimulated sharply by informal advice from ordnance officials urging the placing of all units possible before April 1 to avoid delivery delays later. As a result entire machine tool equipment programs are being brought forward and hundreds of tools are being awarded builders through Wright Field, O., for the expanding aircraft production program. This is filtering through to numerous industries; bearing producers are awarding additional contracts, the already heavily loaded shops building screw machines are adding to backlogs and precision instrument makers are buying more equipment. Numerous instances of plants adding to machine tool requirements for new buildings are noted before shops now under construction are completed. Machine tool builders are subcontracting on an increasing scale, farming out many fixtures and parts which they formerly made in their own shops. This has enabled some shops in the Worcester area to attain peak production not thought possible. Parts and materials, including steel, are reaching assembly lines steadily with only occasional delays, the chuck situation having improved slightly with most shops. A Worcester lathe builder has booked a large supplemental order for the navy while in the heavier equipment field, bids close March 25 on five bridge and four wall cranes, electric traveling type, for a navy yard.

Seattle—Defense projects are calling for a large volume, electrical items and ground-moving machinery being in particular demand. The Bonneville Power Administration, whose program is considered essential to national defense, is purchasing heavily. Following low bids are reported: Olympia Foundry Co., Seattle, weights, $1168; Stusser Electric Co., Portland, 108,000 feet steel conduit, $38,063; Pennsylvania Transformer Co., Pittsburgh, four 1667-kva transformers, $37,996; two identical bids, $1133, for distribution



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. . . and twelve o'clock noon lighting at twelve o'clock midnight is economical lighting when you use G-E Fluorescent Starters. Economical because . . .

They help your lamps to last longer! How? G-E Starters are designed by Mazda Lamp engineers to have the correct starting characteristics to start your lamp at the *exact* proper time—not before, not after. There is no needless waste of emission material (vital to long lamp life) when you use G-E Starters.

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Even the annoying blinking and flickering at end of normal lamp life is eliminated and starter life is prolonged by using the "No-Blink" starter, developed and introduced by General Electric.

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GENERAL ELECTRIC

Nonferrous Metal Prices

Mar.	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
1-21	12.00	12.12½	11.75	52.00	52.00	6.50	6.35	8.25	15.00	14.00	35.00
22-27	12.00	12.12½	11.75	52.00	52.00	6.50	6.35	8.25	15.00	15.00	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	19.48
Copper, hot rolled	20.87
Lead, cut to jobbers	9.75
Zinc, 100 lb. base	13.15

Tubes

High yellow brass	22.23
Seamless copper	21.37

Rods

High yellow brass	15.01
Copper, hot rolled	17.37

Anodes

Copper, untrimmed	18.12

Wire

Yellow brass (high)	19.73

OLD METALS

Dealers' Buying Prices

(In cents per pound, carlots.)

Copper

No. 1 heavy	9.50-10.00
Light	7.50- 8.00

Brass

No. 1 composition	9.00- 9.50
Light	6.00- 6.50
Heavy yellow	6.50- 7.00
Auto radiators	7.25- 7.75
Composition turnings	7.75- 8.25

Zinc

Old	5.25- 5.75
New clippings	6.75- 7.25

Aluminum

Clippings	10.50-11.00
Cast	10.00-10.50
Pistons	10.00-10.50
Sheet	10.00-10.50

Lead

Heavy	5.12½-5.62½
Mixed babbitt	6.00- 7.00
Electrotype shells	5.00- 5.75
Stereotype, Linotype	6.50- 7.50

Tin and Alloys

Block tin pipe	45.00-47.00
No. 1 pewter	37.00-39.00
Solder joints	9.50-10.00

SECONDARY METALS

Brass ingot, 85-5-5-5, l.c.l.	13.25
Standard No. 12 aluminum	14.50

panels. Central Cable Corp. Jersey Shore, Pa., six tons copper cable, $2120; power shovel awarded to Contractors Equipment Co., Portland, $16,332. Following bids are called: March 27, insulated wire, No. 2686; cross arm fixtures, No. 2689; March 28, distribution transformers, No. 2679; conductor and hardware, No. 2693; March 31, six trailers, No. 2698; April 1, pole line and guy hardware, No. 2697; April 3, carrier current pilot relay telephone equipment for 12 substations, No. 2670. Tacoma received bids March 19 for three 60-passenger gas buses and has called bids April 6 for three 3333-kva outdoor type transformers, $25,000 available, also $12,000 available for grounding transformers at tideflats substation.

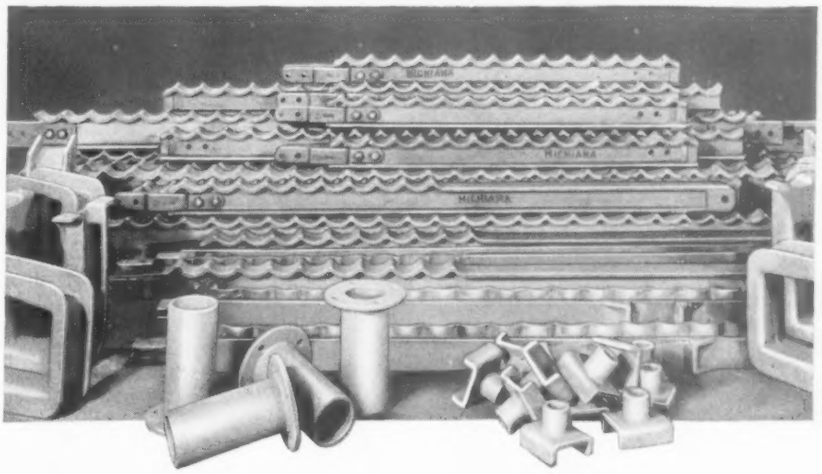
Nonferrous Metals

New York—Field inspectors are attempting to get a greater degree of compliance with WPB and OPA orders affecting nonferrous metals. Members of the various metal trades are being asked to expose violators of these orders as a means of aiding the war effort.

Copper — Inspectors have surveyed primary producers and fabricators to see if rules are being obeyed and are now conducting a full scale investigation among secondary copper and brass smelters and scrap dealers. Consumption declined last month to 118,000 tons of copper from 126,000 in January and 144,000 tons in August, 1941, the peak rate.

Lead — Production has increased

MICHIANA Heat-Resistant Alloy Parts for Walking Beam Furnace



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Particularly where many heat-resistant alloy castings are parts of complete assemblies, are uniformity of quality and accuracy of each part important to insure maximum performance.

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- Boxes
- Rails
- Rolls
- Retorts
- Pots
- Grids
- Tubes
- Sprockets
- Chains
- Heat-Resistant and Stainless Steel Castings of all kinds.

★ Here you get a quick picture of Central Screw Company's ability to furnish newly designed small Upset Parts for practically every armament, implement and instrument of war production, in addition to *standard* and *special* Screws—Bolts—Nuts and Rivets.

WE URGE YOU—Send your battle prints to Central without delay. Write

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steadily so far this year, making larger tonnages available for the WPB pool as well as for sale directly to consumers. On a daily basis, production was 1794 tons in February compared with 1722 in January.

Zinc—The trade expects WPB to extend order M-11, authorizing the zinc pool, beyond the present expiration date of March 31. Producers may be asked to contribute 60 per cent of high grade production and 50 per cent of the common grade instead of the present rates of 50 and 40 per cent, respectively.

Tin—In view of present restrictions on use and the adoption of more efficient practices in consumers' plants, the supply situation remains satisfactory. Some imported tin continues to arrive in the United States; shipments originating from the Far East are straggling in while those from Africa and from Bolivia continue to arrive regularly.

Molybdenum Allocation Order To Become Effective May 1

Consumers of molybdenum have been notified that, because of lack of time, General Preference Order M-110 which calls for a complete allocation system will not be placed in effect in April.

Requests for delivery of molybdenum must be received by the WPB by the 20th of the preceding month, it was explained, and the complete working of the order will take effect May 1.

For the remainder of March and April these general rules should be observed:

No order should be placed or accepted which will increase the customer's minimum working inventory.

Shipments during March or April should not exceed shipments made to the same customer during either January or February, whichever was the greatest. If such an amount already has been shipped for March no further shipments should be made for the month.

OPA "Suggests" Maximums For Certain Aluminum Scrap

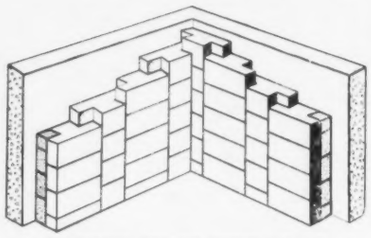
Proper maximum prices for several grades of segregated solid aluminum alloy scrap not presently covered by Price Schedule No. 2 were suggested last week by OPA.

Following are the prices suggested for carload quantities of segregated solid aluminum alloy scrap other than 2S, f.o.b. point of shipment:

Loose scrap, too heavy to briquette, 12 cents per pound; Briquetted or tightly baled scrap, 12 cents per pound; Loose baled or packaged scrap, suitable for briquetting, 11½ cents per pound; Ioose scrap, suitable for briquetting, 11 cents per pound.

Keagler-Nukem

MONOLITHIC ACID PROOF CONSTRUCTION BRICK SHAPES



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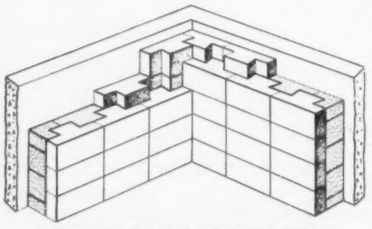

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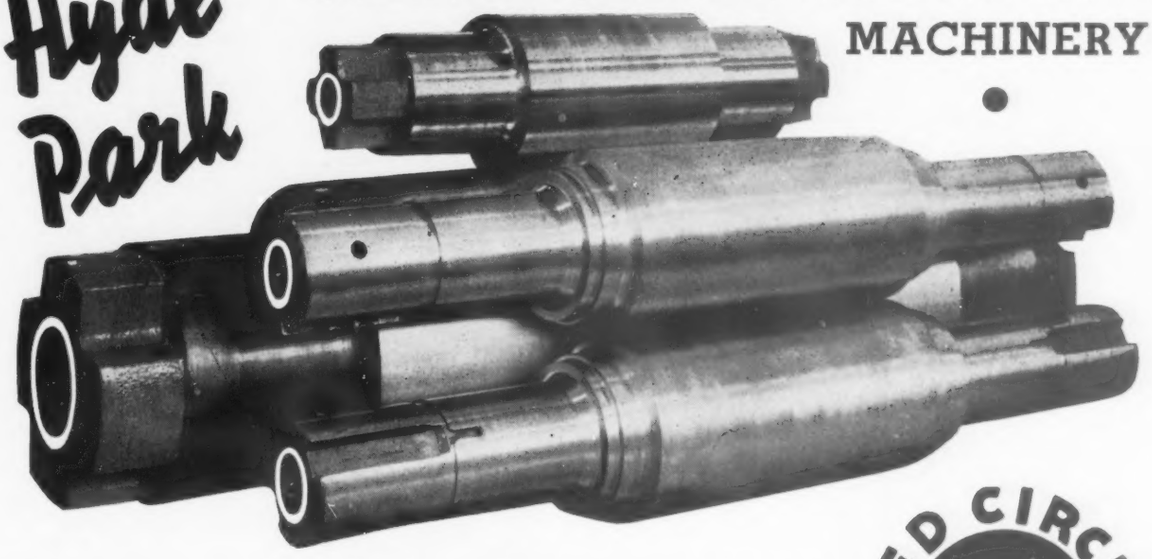

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Sheet and Tin Mill Shears of all kinds, Roll Lathes, Steam Doublers, Sheet Pack Carriers, Stretcher Levellers and Rolling Mill Machinery built to specifications.

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HYDE PARK FOUNDRY & MACHINE CO.

Hyde Park (*Pittsburgh District*) **Pennsylvania**

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When you buy Preformed "HERCULES" (Red-Strand) Wire Rope, you get a Preformed wire rope of the very highest quality . . . not only as to quality of material, but fabrication as well. As it is furnished in both Round Strand and Flattened Strand construction, there is a right rope for every heavy-duty purpose.

Why not take advantage of the time and money saving possibilities of Preformed "HERCULES"? Try it, then compare its performance record with that of any other rope you have ever used.

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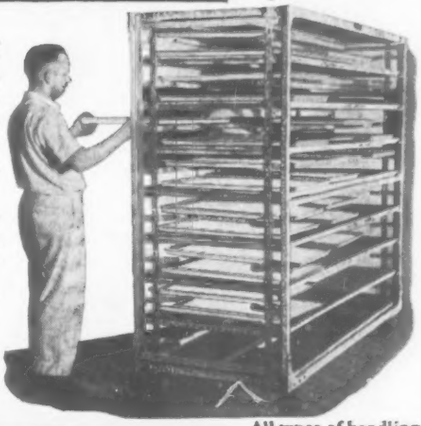

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ALBION, MICH.

Construction and Enterprise

Ohio

CLEVELAND—Glen Tool & Mfg. Co., recently organized, will start production about May 1 of tool and die machinery in a plant at 878 East 152nd street.

CLEVELAND—S. K. Wellman Co. is adding 2400 square feet of storage space to plant at 1381 East Forty-ninth street.

CLEVELAND — Dickey-Grabler Co., 10302 Madison avenue, will soon start addition of 4000 square feet to its metal stamping die factory. Dan A. Miller is general manager.

CLEVELAND—Ohio Piston Co., C. Birnbaum, president, 5337 St. Clair avenue, is adding 3500 square feet to factory at cost of $80,000.

CLEVELAND—Marquette Metal Products Co., 1145 Galewood drive, Herbert Gleitz, president, will continue expansion program with 36,900-square foot addition to factory on Velour road.

CLEVELAND — Schirmer-Dornbirer Pump Co. will soon start an addition to present building at 1719 East Thirty-ninth street. Waldo P. Schirmer is president.

CLEVELAND—B. & S. Screw Products Co., 1515 Colt road, will move to new building on Collamer street, and a $10,000 addition, containing 3000 square feet, will be built to new plant.

KENT, O.—Gougler Machine Co., C. L. Gougler, president, has asked bids for one-story 50 x 130-foot factory, costing $40,000. C. G. Kistler, Getz building, engineer.

NEWARK, O.—City, A. D. Lockwood, mayor, and Samuel A. Anderson, service director, plans sewage disposal plant, costing $2,000,000.

RACINE, O.—Village, Chester Simpson, clerk, will take bids early in April for pump house and pumping equipment. Paul W. Elwell, 5005 Euclid avenue, Cleveland, consulting engineer.

RUTLAND, O.—Village, M. S. Roush, clerk, plans water filtration plant and distribution system. Paul W. Elwell, 5005 Euclid avenue, Cleveland, consulting engineer.

WILLOUGHBY, O.—Patt Bros. Co. Inc., Silvester Patt, president, is adding 1320 square feet to its machine shop at 72 Vine street.

YOUNGSTOWN, O.—William B. Pollock Co., 101 Andrews avenue, is adding a fabricating building at cost of $110,000 and an addition to plant at cost of $65,000. Equipment will cost about $225,000.

New York

JAMESTOWN, N. Y.—Marlin-Rockwell Corp., 420 Chandler street, has plans by Beck & Tinkham, Bailey building, for one-story plant addition. Estimated cost $40,000.

New Jersey

JERSEY CITY, N. J.—National Bearing Metals Corp., 264 Ninth street, has asked bids for two-story 50 x 100-foot plant addition.

NORTH BERGEN, N. J.—Owner, care of J. Garibaldi Organization, 79 River street, Hoboken, N. J., plans one-story factory.

Pennsylvania

ERIE, PA.—American Meter Co. has been granted permit to construct a $15,000 addition to its brass foundry.

Michigan

DETROIT—Practical Engineering & Mfg. Co., 1462 National Bank building, has been incorporated with $25,000 capital to manufacture metal and plastic products. Correspondent: Thomas V. Le Cicero, 4394 Harvard avenue.

DETROIT—Dynamic Tool Co., 2826 David Stott building, has been organized with $100,000 capital to design and manufacture tools, dies, etc. George H. Lesak, 15775 Ward avenue, correspondent.

SAGINAW, MICH.—Lufkin Rule Co. will erect an addition to its factory, 50 x 80 feet. Fred Beckbissinger, Saginaw, architect.

DETROIT—Walter H. Desimpel, 1440 Bishop, Grosse Pointe, Mich., has been awarded contract for an addition to factory on West Jefferson avenue. John L. Pottle, 2424 Calvert, architect.

DETROIT—Talbot & Meier Inc., 1000 Larchwood, has been awarded contract for addition to plant of Detroit Lubricator Co. Derrick & Gamber Inc., 3500 Union Guaranty building, architect.

MONROE, MICH.—Monroe Auto Equip-

Superior steel corporation

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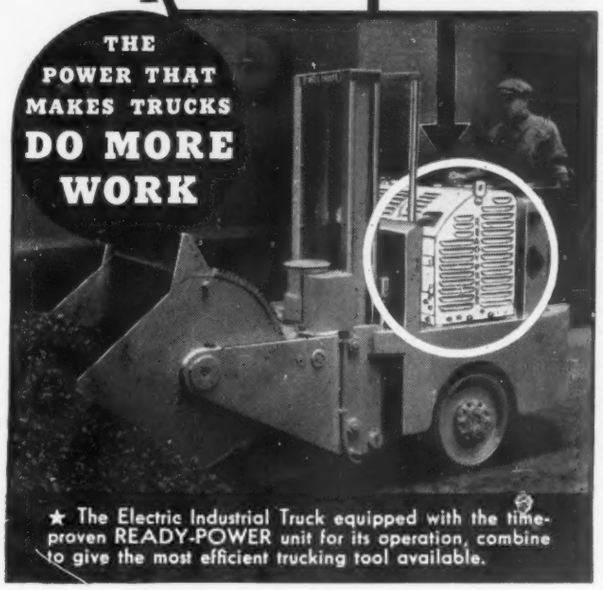

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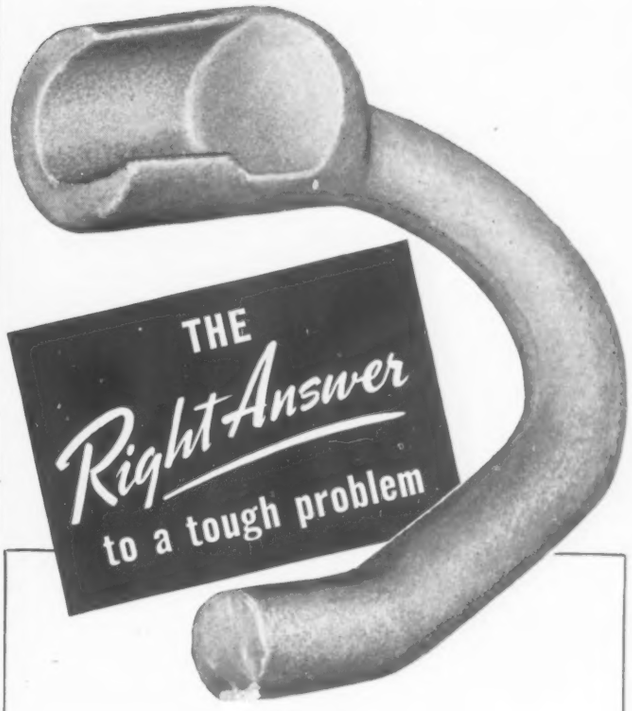

FORGINGS like this don't just happen. They're the result of knowledge, experience, and good engineering. This particular yoke, forged from carbon steel, is used in the pole line hardware field. According to the specifications, the socket on the larger end had to be closed so that a pin or button would slip in freely and yet would be held so that it could not escape when tension was applied. And Phoenix is turning them out exactly to specifications.

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PHOENIX MANUFACTURING COMPANY
Catasauqua, Pa.
Phoenix Products Mean Quality

ment Co. is taking figures for an addition to its factory, 212 x 235 feet. Reed M. Dunbar, Monroe, architect.

Illinois

CHICAGO—Bates & Rogers Construction Corp., 111 West Washington street, Chicago, and Charles W. Cole & Son, South Bend, Ind., have been awarded contract for a $30,000,000 shell-loading plant in Illinois.

Missouri

ST. LOUIS—Bank Building & Equipment Corp. of America, Ninth and Sidney streets, has leased building at 750 South Broadway and will spend $40,000 in remodeling it for manufacture of demountable prefabricated homes; will install heating plant and woodworking equipment.

ST. LOUIS—American Stove Co., 825 Chouteau avenue, has awarded contract to Rhinehart Construction Co., 4030 Chouteau avenue, for one-story, 72 x 160-foot addition to its plant. Cost, including equipment, will be in excess of $40,000.

Oklahoma

TULSA, OKLA.—City, W. F. McMurry, water superintendent and engineer on PWD projects, will take bids April 6 for one steam turbine driven centrifugal pumping unit and auxiliary equipment.

Wisconsin

MILWAUKEE—Taylor Mfg. Co. will erect one-story factory, 60 x 61 feet at its plant on West Meinecke avenue. Oscar R. Knab is architect, and Val Schramka Building Co., contractor.

MILWAUKEE—Interstate Drop Forge Co., 4051 North Twenty-seventh street, has let contract for one-story 60 x 100-foot shop and office building to E. Steigerwald & Sons Inc., 53110 West State street. Estimated cost $60,000. Building Engineering Service, 1101 North Van Buren street, engineer. (Noted March 2).

OSHKOSH, WIS.—Bell Machine Co., has awarded contract to Edward H. Meyer Construction Co., 75 Main street, for one-story 24 x 117-foot factory addition.

WAUPUN, WIS.—National Rivet & Mid State Mfg. Division, Shaler Corp., has plans by R. A. Sutherland, 259 East Wells street, Milwaukee, for two-story 180 x 183-foot addition.

Texas

DAINGERFIELD, TEX.—Southwestern Iron, Steel & Coke Co., John W. Carpenter, Dallas, Tex., will establish plant here to cost over $14,000,000, including 1200-ton blast furnace, 60 coke ovens, water supply system, ore benefication plant and power plant.

GALVESTON, TEX.—George E. Cole has contract for addition to plant of Gray's Iron Works Inc., 1901 Water street. Estimated cost $50,000.

MIDLAND, TEX.—City, M. C. Ulcer, mayor, has $79,000 FWA funds for additional unit at disposal plant, total cost of which is $89,000. L. A. Rodenhiser, engineer.

California

ALHAMBRA, CALIF.—A pattern shop is being erected at 3121 Mission street, Los Angeles, for Consolidated Steel Corp., 5700 Eastern avenue, to cost $9000.

LOS ANGELES—H. K. Smelting & Refining Co. has been incorporated by Harry and Gussie Keller and A. N. Maquis II. Representative: E. I. Gottlieb, Bankers building, Los Angeles.

LOS ANGELES—Southwest Machine Tool & Die Co. is the firm name under which Charles R. Curtiss, R. Frank Bolas and William H. Gronow have obtained a certificate to conduct business at 2619 West Slauson avenue.

LOS ANGELES — Utility Fan Corp., 4851 South Alameda street, is erecting an addition to its factory at 1865 East Fiftieth street, 120 x 241 feet. Cost about $30,000.

LOS ANGELES — Precision Machine Works has been incorporated with 2500 shares of no par value stock, by James O. Ball, Celia Perhacs and Charlotte Jackson. Representative, Harry A. Goldman, 215 West Seventh street.

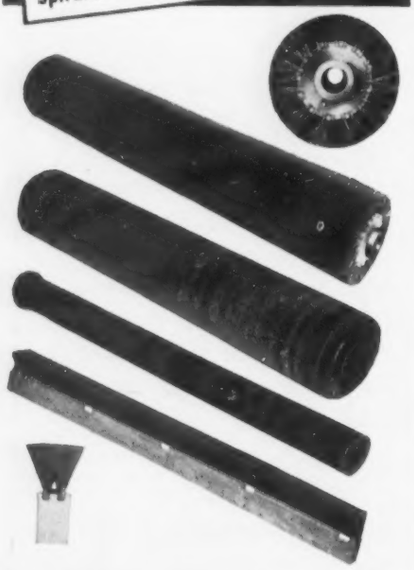
LOS ANGELES—Plans are being prepared for an addition to provide 150,000 square feet of floor space at a North American Aviation plant in the Los Angeles area.

LOS ANGELES—Kinney Tool & Die Co. has been incorporated with $25,000 capital, by H. T. Kinney, J. H. Byrnes and G. D. Tobey. H. T. Kinney, 2525 East Forty-ninth street, is representative.

Oregon

PORTLAND, OREG.—Pacific Chain & Mfg. Co., R. S. Miller, president, is erecting an addition to its plant at 1901 Wilson street Northwest. New forming machines, steel cutting and electric weld-

FULLERGRIPT BRUSHES
For your machine needs.
Made with metal backing;
spiraled or formed to specifications.



FULLERGRIPT BRUSHES for your Pickling, Galvanizing and Tinning Departments. Furnished in straight strips to be applied to your present wood blocks for the removal of middlings.

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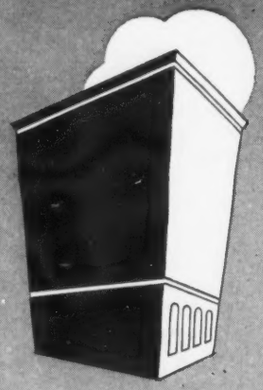

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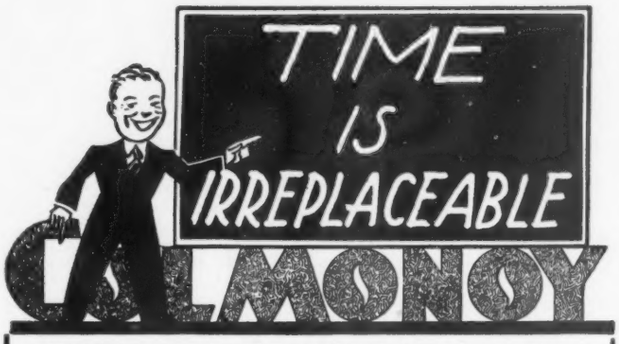

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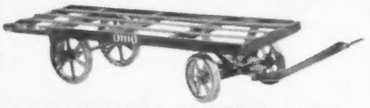

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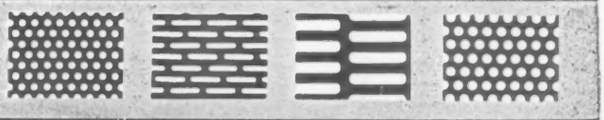

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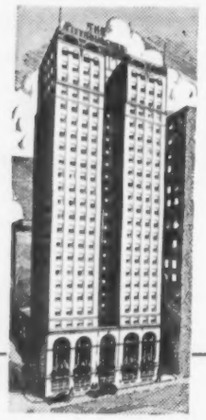

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District of Columbia

WASHINGTON—War Department has authorized construction of manufacturing plant in Maryland at cost in excess of $5,000,000; construction under supervision of office of Corps of Engineers, Washington.

Washington

BREMERTON, WASH.—City will soon call bids for proposed $417,000 water system, of which $217,000 in federal funds is available.

GRANDVIEW, WASH.—Smith & Judd Inc. is enlarging farm machinery repair shop, and will install equipment.

ILWACO, WASH.—Bids for proposed filter plant have been rejected and new bids will be called soon. Hostmark Engineering Co., Seattle, engineer.

SEATTLE—Cunningham Steel Foundry Co., 4200 West Marginal way, is erecting a plant addition.

SEATTLE—Lake Union Drydock & Machine Works, 1515 Fairview avenue North, is making plant alterations and improvements.

VANCOUVER, WASH.—Kaiser Co. Inc. has awarded Reimers & Jolivette, Portland, Oreg., contract to erect 15 buildings, including acetylene shop, mold loft, garage, lockers, etc., in connection with establishment of shipyard. Wegman & Son, Portland, will erect the boiler plant and offices.

Canada

BELLEVILLE, ONT.—Stephens-Adamson Mfg. Co. of Canada Ltd., 30 Franklin street, will build plant addition, 60 x 60 feet to cost about $10,000, equipment extra.

HAMILTON, ONT.—National Steel Car Corp. Ltd., Kenilworth avenue North, Robert S. Hart, vice president, will take bids through Hutton & Souter, Architects, Pigott building, for construction of steam hammer building to cost about $65,000. Work is proceeding on enlargements to shell shop unit, and plans are underway for other additions here.

HAMILTON, ONT.—Dominion Foundries & Steel Ltd., Depew street, is having plans prepared by C. D. Howe Co. Ltd., Pigott building, for further large addition to plant here.

LONDON, ONT.—Sparton of Canada Ltd., 100 Elm street, G. A. Holmes, secretary and manager, plans addition to plant to cost about $50,000, with equipment.

OTTAWA, ONT.—Department of Munitions and Supply, H. H. Turnbull, secretary, will soon call bids for ordnance depot on Somerset street, 300 x 1000 feet, to cost about $750,000.

TORONTO, ONT.—Toronto Elevators Ltd., Queen's Quay, has given general contract to Carter-Halls-Aldinger Co. Ltd., 419 Cherry street, for construction of boiler house to cost $10,000. Plans prepared by C. D. Howe Co., Public Utilities building, Port Arthur, Ont.

TORONTO, ONT.—Accurate Machine & Tool Co., 66 Spadina avenue, has had plans prepared by E. I. Richmond, architect, 455 Spadina avenue, and will soon call bids for plant at 470 Gerrard street East.

TORONTO, ONT.—Coulter Copper & Brass Co. Ltd., Sumach street, has given general contract to Holtby Contracting Co. Ltd., 279 Rusholme road, for further addition to plant to cost $21,000. Harkness & Hertzberg, 57 Bloor street West, engineers.

WINDSOR, ONT.—Essex Wire Corp. Ltd., 1635 McDougall street, J. H. Sommerville, general manager, has acquired site and plans immediate construction of plant here to cost about $200,000, with equipment.

WINDSOR, ONT.—Chrysler Corp. of Canada Ltd., 300 Tecumseh street, has had plans prepared by Hutton & Souter, architects, Pigott building, Hamilton, Ont., for plant addition here to manufacture aircraft engines.

LAUZON, QUE.—Department of Munitions and Supply, Ottawa, H. H. Turnbull, secretary, has let general contract to Angus Robertson Ltd., 660 St. Catharine street West, Montreal, for construction of shipbuilding berths here to cost $663,000.

MONTREAL, QUE.—Commercial Alcohols Ltd., 3176 Notre Dame street East, has let general contract to Sutherland Construction Co. Ltd., 1440 St. Catharine street West, for plant addition to cost about $150,000, with equipment. McDougall & Friedman, consulting engineers, 1440 St. Catharine street West.

MONTREAL, QUE.—Canadian Marconi Co. Ltd., 2440 Trencton avenue, has received bids and will immediately let contracts for addition to main plant to cost about $100,000, with equipment. James C. Meadowcroft, 1154 Beaver Hall Square, architect.

SHAWINIGAN FALLS, QUE.—Aluminum Co. of Canada Ltd., Sun Life building, Montreal, has let general contract to Fraser-Brace Engineering Co. Ltd., 360 St. James street West, Montreal, for four additional pot rooms to cost over $1,000,000.

THETFORD MINES, QUE.—Asbestos Crude & Fibre Mines Ltd. is having plans prepared by Jacob A. Jacobs, 510 Castle building, 1410 Stanley street, Montreal, for plant buildings here to cost over $150,000.

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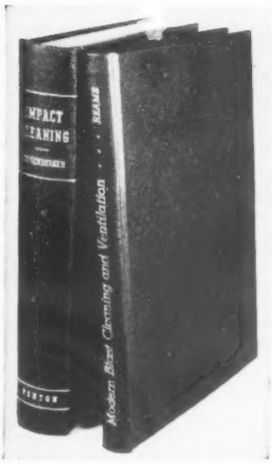

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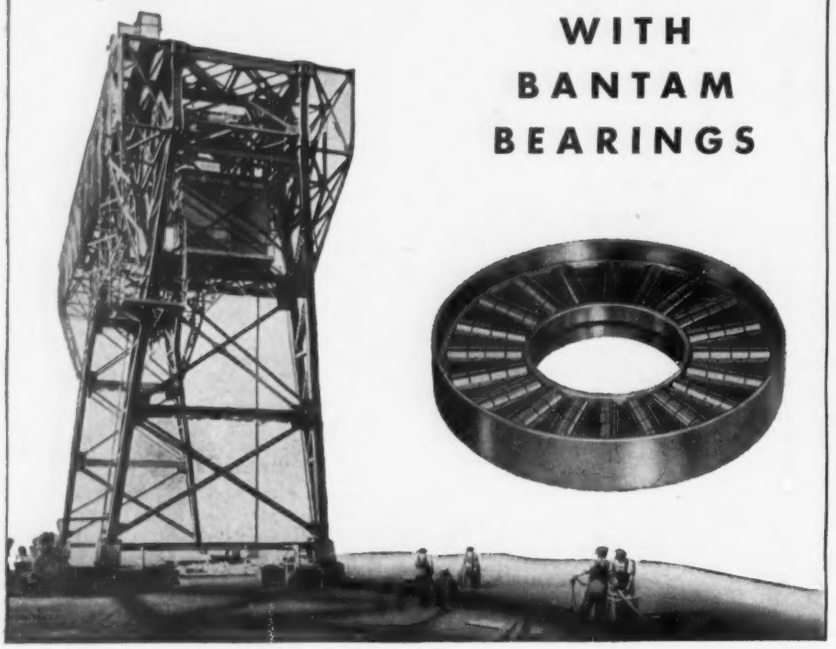
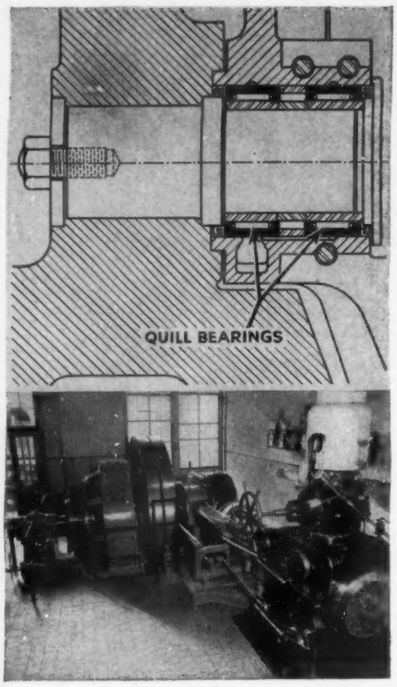
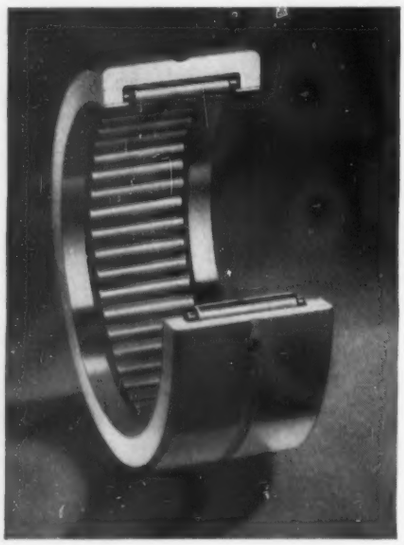


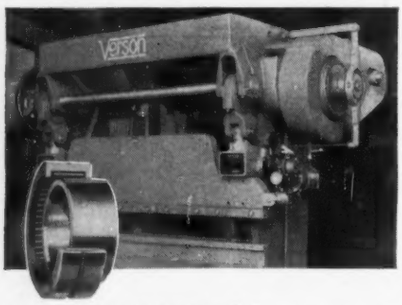
GIGANTIC SHIPBUILDING PROGRAM is a vital part of America's production for victory—and cranes in the nation's shipyards are called on to carry tremendous loads. This 350-ton gantry crane built by Shepard Niles Crane & Hoist Corporation—the largest of its type ever constructed—is used for handling battleship turrets. Bantam Roller Bearings under the collars of the load hook contribute to dependable operation of this giant crane. Bearings shown in inset are provided with Bantam's "Lubricage"—a special one-piece cage construction that facilitates correct lubrication.



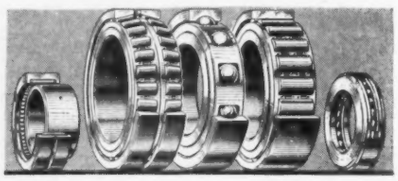
IN MODERN STEAM ENGINE DESIGN, efficiency and economy are prime considerations. In this Filer & Stowell 400 KW steam-electric generating unit, Bantam Quill Bearings on the governor arm contribute to efficient, economical operation, because of their low coefficient of friction and ability to run for long periods of time with little need of service attention. Location of Quill Bearings is shown in cross-section view.



READILY AVAILABLE FOR DEFENSE NEEDS, the Bantam Quill Bearing is constantly finding new industrial applications. Cut-away view shows the simple, rugged construction of this compact anti-friction bearing, widely used because of its low cost, high load capacity, small size, and ease of installation and lubrication. For full details on this unusual bearing, write for Bulletin H-104.



METAL FORMING PLANTS find many uses for this 45-ton press brake, built by Verson All-steel Press Company for such applications as straightening armor plate, forming aircraft parts, and producing munitions boxes and other equipment. High-speed flywheel shafts of these machines rotate on Bantam Quill Bearings.



EVERY MAJOR TYPE of anti-friction bearing is included in Bantam's line—straight roller, tapered roller, needle, and ball. Bantam serves every industry with a wide range of standard bearings that meet many normal requirements. Bantam engineers offer unbiased advice on selection of standard bearings—and design custom-built bearings in large sizes or special types for unusual conditions. If you have an exceptionally difficult bearing problem, TURN TO BANTAM.

BANTAM BEARINGS

STRAIGHT ROLLER · TAPERED ROLLER · NEEDLE · BALL

BANTAM BEARINGS CORPORATION • SOUTH BEND • INDIANA

YOU could start a new machine operator every morning without a minute's worry over the safety of your bearings—

Because all he needs to do is give the Farval Central Pumping Unit a few strokes and—every bearing gets exactly the amount of lubricant it requires.

In less than one minute and while the machines are in full operation, complete lubrication is obtained in perfect safety from the floor.

A Farval Centralized System of Lubrication protects you in advance against shutdowns due to faulty lubrication—keeps your overloaded machines in full production on 24-hour schedules.

In addition, Farval will reduce power consumption as much as 30%—increase life of bearings up to 10 times—lower maintenance cost by 75%.

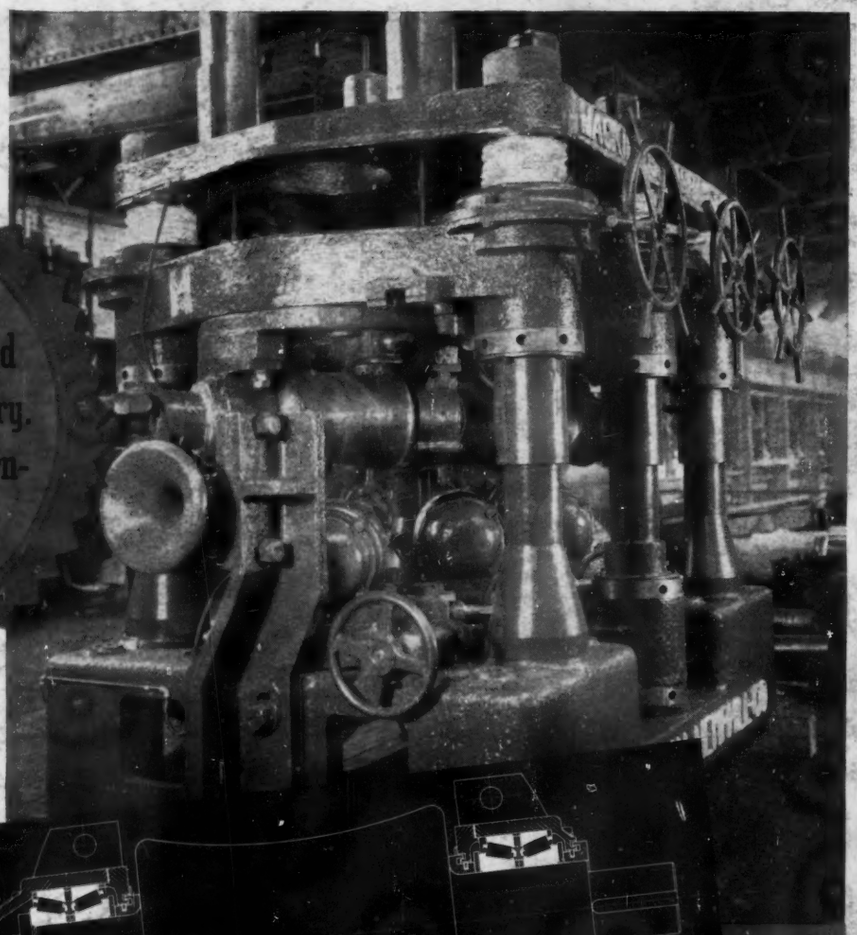
The Farval Corporation, 3270 East 80th Street, Cleveland, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Manufacturers of Automotive and Industrial Worm Gearing.
In Canada: PEACOCK BROTHERS LIMITED

FARVAL

CENTRALIZED SYSTEMS OF LUBRICATION

Timken Bearings are keeping wheels and shafts turning for Victory. They'll keep them turning for prosperity afterwards.



Application of Timken Bearings to the roll necks of the above bar straightener.

There are 28 Timken Tapered Roller Bearings on guard against friction, radial loads, thrust loads and misalignment in this Mackintosh-Hemphill Bar Straightener—12 on the roll necks, 16 in the drives.

This machine is designed to handle 6" diameter solids and 9½" diameter tubes, which gives some idea of the loads imposed on the bearings. It is in operation at a Canadian armament plant.

There is hardly any kind of equipment used in the steel industry that does not embody the speed, accuracy, dependability and endurance of Timken Roller Bearings. These machines—many of them redesigned to include a full complement of Timken Bearings—will greatly assist economic rehabilitation in the years to come.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TO ASSURE VICTORY
BUY UNITED STATES DEFENSE BONDS & STAMPS

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; and Timken Rock Bits.